THE HEALTH AND HAPPINESS SERIES

# THE WAY TO KEEP WELL

NEWMAYER AND BROOME

Eleanor Hendling
Eleanor Hendling.

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1928
Health; Happiness
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Outdoor Play at School

The Health and Happiness Series

# THE WAY TO KEEP WELL

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THE WAY TO KEEP WELL

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# PREFACE

"The Way to Keep Well," the third book in the Health and Happiness Series, is a simple textbook of hygiene, complete in itself.

Hygiene is one of the most practical subjects in the school curriculum. It includes both information and training of vital importance. Besides learning the rules for good health, the pupil should be persuaded to follow them.

With this objective constantly in view, "The Way to Keep Well" gives chief place to the advantages of good health and to the habits necessary to insure it. Anatomy, physiology, and technical terms are reduced to a minimum. Brief anecdotes and incidents from real life are used here and there to enlist the pupil's interest and to show the importance of the rules for good health. The many illustrations have been carefully made or selected for the same purpose — to aid in teaching proper health habits.

The book is adapted for use in various ways, as preferred by different teachers. First, the text may be explained and lessons assigned for study in class or at home; in which case the questions at the end of each chapter, with others which the teacher may wish to ask, may be used as a basis for recitations. Second, in the open-book method, the text may be read aloud and discussed by the pupils in class, together with the questions. In either of these plans the projects, topics, and problems under the heading "Helpful Things to Do" may be assigned to the class, to groups, or to individual pupils for inquiry and report. Third, the text may serve, in accordance with an approved practice to-day, primarily as material for answering the questions at the end of each chapter, and for helping to solve the problems that are suggested under "Helpful Things to Do." In any case it is believed that all the pupils should have an opportunity of reading the chapters consecutively, either as assigned lessons or silently in class under the guidance of the teacher. It is hoped, too, that the pupils may take the book home frequently, and that the intelligent coöperation of parents may be enlisted in promoting the main objective of this course — the health and happiness of children.

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# CHAPTER I

## THE WINNERS IN THE RACE FOR HEALTH

The runners were off; the excitement was great; everybody was standing and cheering. In a few seconds the race was over and a hero was made. George Hill had won the 100-yard dash. He made the spurt in ten seconds and ended with a smile. He was almost as fresh when he reached the tape as when he began.

"He always was a lucky boy," said some of his friends.

**Do Not Trust to Luck.** — In the crowd that watched that strenuous test of strength and speed were teachers, doctors, and physical trainers. Let us ask these people, who should know, how much of the winner's success was due to luck.

A physical trainer is a man who trains boys for athletic contests and shows them how to make every ounce of strength give results. The trainer examines each applicant carefully. He wants to know the weight of each boy in relation to his height, how well the organs of the body act, and how much exertion the boy can endure. Let the trainer answer our question about the "lucky" winner: "There is no luck in George Hill's case. He has built up a sturdy body and has kept it fit."

**Form Good Habits.** — George's teacher will tell you that George is as good a student as he is an athlete. He has an active, alert mind. He watches his goal and has the physical power to reach it. He has good, clean habits.

Where and how did George form these habits? His mother says that he has *always* eaten good, nourishing food and has had plenty of fresh air, exercise, and sleep. George started right and kept it up. In other words, he formed the right habits when he was very young.

**The Human Machine.** — A doctor has studied for many years about the human body. One of his duties is to give advice on how to get and keep

good health. He knows the different parts of the body and how they work. He knows what may interfere with the work of the parts of the body and cause harm. The study of the parts of the body is called *anat'omy;* the study of how the parts of the body do their work is called *physiol'ogy;* the study that teaches us how to care for the body so that it will be well and strong is called *hy'giene.*

FOODS THAT BUILD STRONG BODIES — POWERFUL MUSCLES, STURDY BONES, SOUND TEETH

The doctor will tell you that George is lucky in that he started in the race of life with a strong and healthy body. He then learned how to keep his body in good condition. The body is a wonderful machine, and each part has a proper use. George cares for every part, exercises regularly, and gets the most use out of his body with the least amount of exertion. Each part of the body helps the other

parts; and all working together make a perfect machine. The trainer says that there is no lost motion in a well-trained body.

**Good Health Brings Happiness.** — We envy George not only because he is the hero of the hour, but also because he possesses such a sturdy body. He always has good health. Every boy and girl should know what *good health* means. Most of us have been ill at some time, and we realize how illness spoils our work, play, and happiness. We have seen and heard enough about the advantages of good health to strive to get it and keep it.

Most of the men and women who have done great things in the world have been among those who have had good health. President Roosevelt as a boy was sickly, but he realized his handicap and spent a large part of his life in making his body strong and healthy and keeping it so. He succeeded by practicing the rules of hygiene.

**Good Health Brings Success.** — Sometimes we hear about a frail body and a keen mind accomplishing great things. But this is the exception rather than the rule. We realize how much more the same person might have done if he had possessed a healthy and strong body. A sturdy body can endure more and can meet the demands of life better than a weak one. People who are well can get more enjoyment and pleasure out of life than weak and sickly people.

**Learn How to Live.** — In the middle of the nineteenth century the average man in America lived to the age of forty years, while to-day the

COLONEL CHARLES A. LINDBERGH
Just before he crossed the Atlantic Ocean alone in his airplane. His good health helped him to success.

average length of life is about sixty years. This extension of human life has been gained because we now know more about how to care for the body. The most useful lessons that we can learn are how

to avoid illness, how to prolong life, and how to get our full share of happiness through good health.

It is the object of this book to teach you how to acquire good health, and how to keep it, so that you may live a long and happy life. It is not enough to know the rules of health. You must practice these rules again and again until they become habits.

### Helpful Things to Do

1. Run a hundred yards. Have some one time you to see how long it takes you to cover the distance.

2. Read the life of Theodore Roosevelt. Learn how he made his body strong.

3. Write a short composition about some explorer, such as Peary, or Amundsen, and show how health and physical endurance made possible his success.

4. Find out what your physical condition is now, and what you need to do to improve it.

### Questions

1. Why did George Hill win the race?

2. In what way, if any, are good health and strong bodies due to luck?

3. Would you like to possess a strong body and mind? Why?

4. Why do some people live longer and happier lives than others?

5. What is hygiene? Why should you study it?

## CHAPTER II

## THE CAUSES OF SICKNESS

**The Circus Came to Town.** — The boys and girls of our school had looked forward for several weeks to visiting a circus that was coming to our town on May 10. The work in school seemed easier, and every one seemed happier than usual, because of our plans for a good time at the circus.

The day came at last. It was an ideal spring day. Some of the boys had gone to the railroad station the evening before to see the circus train pull in with its carloads of animals. They told the rest of us all about it. Everybody in our class was happy, except three pupils who were not able to go to the circus.

**Why Some Could Not Go.** — Mary could not go to the circus because she had measles; John had a toothache and a swollen face; and Joe had a broken leg. It seems too bad that there are always some who lose their pleasure because of illness. Illness is costly in other ways. Besides loss of pleasure there is the pain that goes with it; and if one is old enough to work for a living, one loses money while one is absent from work. Of course no one wants to be sick. We all want good health all the time, and we should be willing to work for it.

**Health and Sickness.** — What is good health, and how can we have it? What is sickness, and how can we avoid it? We want to know the answers to these questions because health means much to our success and happiness.

When a large business fails to make a profit, the owner looks into it to try to find the cause of the failure. He may even call in an expert to help him find the trouble. This expert might be called a business-doctor. He goes over the plant with the owner. They try to find what is causing trouble, and why there are no profits. They may find that the machinery is out of order, or that employees are not attending well to their work, or that the business is not carefully managed. These business men are so much interested in the profits of the business that they not only correct the faults, but also try to plan so that there will be no further trouble.

Our unhappy classmates, Mary, John, and Joe, each own an important plant, — his or her body. These plants were sick on circus day and the owners were losing profits. The profits included the fun of

We are Warned by Signs where there is a Catching Illness

going to the circus. Their parents, like the business man, had to call in an expert, the doctor, to find the trouble, to cure it, and to try to prevent it from happening again.

**Causes of Sickness.** — Mary had measles. Some one sick with measles had given the disease to Mary.

Measles, like many other kinds of sickness, is caused by germs and is catching. The germs of measles, as well as of many other diseases, are carried from a sick person to a well person. Germs are very simple kinds of plants or animals, and are so very small that we cannot see them with the naked eye. There may be millions of germs in one small drop of clear water. We shall hear more about germs later.

A person who has an illness that is catching should keep away from others. Mary was not at fault. She was sick because some one else had failed to be careful.

John had a toothache and a swollen face. His failure to be well enough to go to the circus was not of the same kind as Mary's. It was not due to another child's carelessness. John alone was to blame for his illness. John never cleaned his teeth properly, and many days he did not clean them at all. Also John did not eat the kinds of food he needed to build strong teeth. His teeth were soft, and tiny cracks came in the covering of the teeth. Particles of food lodged in some of these cracks, and were left there so long that they fermented. The acid thus formed ate holes or cavities in the teeth, until the teeth began to ache.

John's sickness could have been avoided. He should have formed the habit of caring for his teeth regularly. Then he would have had no trouble.

There are many kinds of illness that can be prevented if we practice good health habits.

Joe missed the circus because he had a broken leg. Joe had been roller-skating. He skated in the street and hitched on the back of a wagon. The wagon suddenly turned and Joe was thrown under the wheels of another wagon. Joe suffered great pain and had to lie in bed for several weeks. His broken leg was due to carelessness. Joe's illness was the result of an accident. Most accidents can be avoided if we take care and observe ordinary rules of safety.

We have learned that sickness may be caused by our own carelessness or by the carelessness of others; also that some kinds of sickness are due to germs, and some are not. We know that most sickness can be avoided. There seems to be a right way to do things if we are to enjoy good health. This right way consists in the practice of a few rules of health. These rules when practiced regularly become habits, just as good table manners become habits if we practice them at every meal.

### Helpful Things to Do

1. Name some illness you have had and tell whether it could have been avoided or not.

2. Name two or three diseases that may be caused by the carelessness of others.

3. Name two or three diseases that may result from one's own carelessness or neglect.

4. Write three rules for good health.

### Questions

1. What are some of the causes of illness?
2. Can some sickness be avoided? How?
3. How can accidents be avoided?
4. What are some of the advantages of good health?
5. How can you avoid giving a cold to others?

# CHAPTER III

## INSPECTION TO KEEP FIT

**An Engine Must be Inspected.** — A large locomotive with a long train of cars comes rolling into the station. The engineer jumps down from his small cab. In one hand he carries a hammer, and in the other a wrench. The engineer goes to each part of his engine and examines it. He taps one part with his hammer; and he tightens a nut or bolt here and there with the wrench. He also carries an oil can with which he frequently oils an important part of the machinery. The engineer will

tell you that he makes this inspection before every run or trip, to assure himself that all parts of the engine are in perfect condition. It is this care that makes it safe for people to ride on his train.

**Soldiers are Inspected.** — Have you ever watched a regiment of soldiers lined up for inspection? Each soldier stands erect and at attention. The officers

*By Burton Holmes from Ewing Galloway*

STUDENTS AT WEST POINT READY FOR INSPECTION

inspect each soldier, observing his posture, the neatness of his uniform, and his general appearance. This is a daily duty in every army. Before any man is enlisted in a regiment he undergoes a complete inspection by a doctor. This examination is necessary because an efficient army must have only those who are strong and fit to stand the hardships of army life. Sickness weakens an army; so it is important to choose those men who are least likely to become ill.

**Boys and Girls Need Inspection.** — Most boys and girls have at some time played soldiers. You may remember when the boys and girls of your neighborhood formed a little army. Each one proudly wore a paper hat, and carried a stick for a gun. There was not much of an inspection, and every one was welcome to join the army. The little boy who was sick had to be content to watch the proud soldiers march by. The same boys and girls who formed this play army then started to school. Again there was an inspection, — an inspection of the school army. Each morning the teacher made her own inspection, a much more thorough inspection than the one of your band that played soldiers. The teacher probably looked at hands, faces, and teeth to see how clean her regiment was.

Then came a school doctor and nurse to examine each boy and girl separately. Like the engineer who goes carefully over his engine, the doctor looks over every pupil to see that he is in good condition.

Why do we have all these inspections? Sickness is a costly and dangerous thing, not only to the one who is sick, but also to those who come into contact with the sick one. Sickness can often be prevented just as accidents can be prevented to the engine — by looking over the machinery before something happens.

**Prevention is Better than Cure.** — Every one has heard the story of the man who locked his stable after his horse had been stolen. This man learned that he needed to use the lock, but he learned it too late. We should learn that the best time to exercise care is before we become sick. After suffering from a bad toothache for many days one is usually very willing to have a dentist treat or pull the tooth. How much better it is to clean and care for our teeth before we begin to suffer pain!

There are several diseases which can be carried from a sick person to a well one. Such diseases are called *catching*. If some one who has measles or sore throat comes to school, he may give the same sickness to many other children. His carelessness may cause much suffering to others. The doctor who inspects school children discovers those who have catching diseases and keeps them away from other children until they are well.

Every boy and girl is anxious to be promoted at the end of each term. One who is sick a great deal loses much time from school, and may fail to reach the next class.

**First Find Out the Trouble.** — Mary was asked to copy some sentences from the blackboard. When her paper was graded it showed that she had made a great many mistakes in her copying. Mary was usually a good student, and the teacher could not understand why she always failed when there

was blackboard work. Finally the problem was solved by the school doctor, who discovered that Mary had poor eyesight and could not see plainly anything written on the blackboard.

In the same class with Mary is a boy named William, who cannot always hear what the teacher says. Naturally, he is not able to learn his lessons so well as the other children, although he works very hard. Mary and William are really sick children.

**Then Correct It.** Mary should have her eyes carefully tested by an oculist, who will know exactly what is wrong. She should then get the glasses ordered by the doctor and wear them. William has already gone to a doctor who is an ear specialist. In time he will be able to hear as well as any one in the class.

A School Nurse

We all like to see a nurse in her white cap and gown. Those who have had a nurse attend them when they were sick cannot forget her kindness. In many schools there are nurses who try to help children correct the things which the doctor has found

to need repair. The nurse also bandages cut fingers or applies something soothing to a wound. Both doctor and nurse are anxious to keep us well and fit for our work. All boys and girls should be willing to help by doing the things they are told to do.

The doctor does another thing that helps to keep us well. He tries to see that the school building is kept in a clean and healthful condition. He insists that we have fresh air, comfortable seats, and enough space for play. Boys and girls can help make the school a healthful place by keeping the classroom and the surroundings clean.

### Helpful Things to Do

1. Write out a list of the things which you believe need attention to make you strong and fit.

2. If you think you are entirely well and that all parts of your body are in good condition, write down some rules which you should follow to keep yourself well.

3. Poor Richard said: "Experience is a dear school, but fools will learn in no other." Write a brief story to show how this applies to the care of the health.

### Questions

1. Why does an engineer frequently examine all parts of his engine?

2. Why does a captain inspect each soldier in his company?

3. Why do many schools have a doctor and a nurse?

4. Does it pay to take much trouble to prevent sickness? Why?

5. What can each boy and girl do to help in having a clean, healthful school?

Boy Scouts in Line for Inspection

HEALTHY CHILDREN LIKE TO PLAY

# CHAPTER IV

## WE KNOW WHEN WE ARE WELL

The teacher's roll-book showed that ten of her pupils had been absent at some time during the week. She asked each one why he had been away. She learned that five of the children had been absent because they were sick.

How did these children know that they were ill and unable to go to school? We shall see.

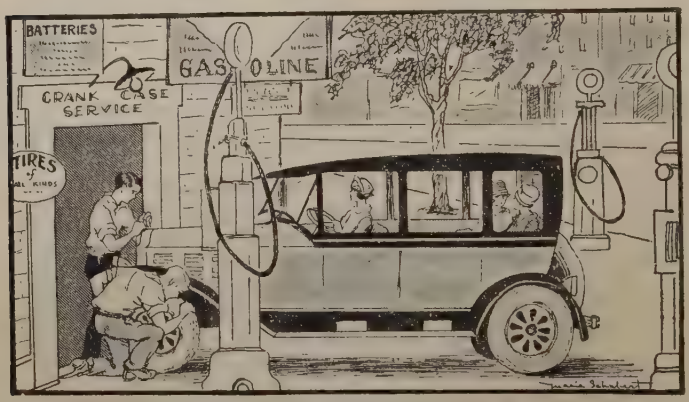
A man gave a watch to his son. The boy was proud of his beautiful timepiece. It told him the

time of day; and he enjoyed listening sometimes to the regular ticking. But one day it stopped ticking, and the hands stood still. The boy shook the watch and it gave a few ticks but again stopped. The watch was out of order, or sick. The boy took it to a watch repairer, a doctor of sick watches. He questioned the boy as to how he cared for the delicate piece of machinery. The watchmaker opened the case and showed the boy the many small shiny wheels, springs, and screws. He told the boy that he had wound the watch too tightly, and had also permitted dust to get on the wheels. The watch became sick and useless for want of proper care. Our bodies are like watches. If we do not give them good care, the machinery does not work properly and we are ill.

**We Need Fuel and Care, like an Automobile.** — We are like an automobile or any other machine in that we require a certain amount of care and attention. The automobile needs fuel in sufficient quantities for power. We need food for fuel to give us energy. The food we eat should be of the proper kind, suited to the machinery of our bodies. We should have enough for our needs. The automobile and the human body both need air and water. Do you know that air has to be brought into the cylinders of the car along with the gasoline? Unless the proper amount of air is mixed with the gasoline vapor, the gasoline will not burn and furnish power.

The air we breathe serves a similar purpose in the body. Without air the food we eat could not be used.

An automobile also needs care and frequent inspections to keep it working properly; that is, to




An Automobile Needs Fuel and Care

keep it healthy. Our own health, like everything else of value, is worth working for. As most illness could be prevented by a little time and effort on our part, we should not only learn the rules of the game of health, but get the habit of practicing them.

**Happiness is a Good Sign.** — When we are sick we usually know it. A sick person does not care to work or play. Nothing interests him. Any one who likes to run, play, and study, does not need to ask himself, " Am I well? "

Sickness keeps boys and girls out of school. Lost time at school or elsewhere is difficult to make up. Still more important is the fact that sickness causes suffering. Pain interferes with our happiness. A smiling and happy person is usually healthy. When we are ill we may easily become cross and unfriendly. People do not seek cross people for companions. We lose many of the pleasures of life during illness.

**Our Looks Tell.** — Our looks, as well as our feelings, tell whether we are well or not. A person who suffers pain from illness usually shows it in the expression of his face. When we see a child with a rosy, pink skin, well-nourished body, and a smile to greet us, we say, " He is a healthy-looking child."

**Our Activity Tells.** — Our activity also tells how well we are. Boys and girls who can take part in all the games and work of school without easily tiring are usually healthy. At recess, a sick child remains in the classroom or alone in a corner of the playground. He misses the pleasure and healthful exercise and wishes he were well enough to join his classmates.

**Illness Not Always Known.** — When John has a toothache, and when Mary has a pain in the stomach, they know that they are not well. Yet a person may be sick and have no pain. There are other signs which should warn people that they are not healthy. Katie awakens in the morning without

feeling rested, although she has had the required amount of sleep. Katie has no smile, and even the sunshine and fresh air do not cheer her. She goes to school, but she does not care much about it. She has no interest in anything. She even finds no pleasure in the games at recess. Katie tires easily after the least effort. She has no pain, but she is a sick child. She is pale and nervous. If some one does not soon find out what is wrong with Katie and correct it, she may become very sick. Perhaps she does not get the right kind of food, or she may not have enough fresh air and exercise.

**Growth a Sign of Health.** — There is still another thing that tells boys and girls when they are well. A healthy child grows. Perhaps you have had a puppy only a few weeks old. A puppy weighs only a few pounds. If he is fed regularly and cared for, the tiny dog steadily grows larger and heavier. He enjoys his food and likes to play. Watch him chase up and down the lawn. As long as the dog is well he keeps growing until he reaches his full size.

Like a healthy plant or animal, children grow if they are well. You should watch your growth by weighing yourself at least once a month, and by occasionally measuring your height. It is not safe to guess at your weight. Between the ages of six and sixteen years, healthy children should gain about two inches in height and at least five pounds in weight each year.

### Helpful Things to Do

1. Answer the question, "Am I well?" and tell how you know you are in good health.
2. Give some advantages of good health.
3. Give some of the effects of ill health.
4. Make a poster showing the difference between a child in good health and one in poor health.

### Questions

1. What are some of the signs of sickness?
2. What are some of the signs of health?
3. Does every sick person have pain?
4. Is knowing what to do sufficient to keep in good health? What more is needed?

A Good Way to Measure Growth

HAVE YOU EVER LOOKED THROUGH A MICROSCOPE?

## CHAPTER V

## FRIENDS AND ENEMIES

Many years ago a Dutchman named Leeuwenhoek (lā′ven-ho͝ok) made lenses of glass and mounted them skillfully. He wanted to see things invisible to the naked eye. He looked at many things through his magic glasses. One day he was amazed to see thousands of tiny living things dancing around in a drop of water. The work of this Dutchman later taught the world that everywhere there are living things too tiny to be seen. We now know that some of these are useful friends while others are dangerous enemies.

**Different Kinds of Bacteria.** — There is a class of living organisms known as *bacte'ria.* They are tiny living cells, found almost everywhere. They are the simplest kind of plant life. Bacteria are so small that a space the size of a pinhead can hold millions of them. You cannot see one bacterium with the naked eye, but colonies containing millions can be recognized.

Most kinds of bacteria are friends and serve a useful purpose. Bacteria aid in making vinegar, cheese, and some other foods; some help in the growth of plants by acting on the soil; some live in our bodies and do valuable service. These kinds of bacteria are truly useful friends.

There are other kinds that destroy food, and there are bacteria that enter the body of an animal or human being and cause disease. Most of the germs that cause disease are bacteria, but a few kinds of disease germs are tiny animals, very small living cells called *protozo'a.*

Scientists who study about germs and their habits use a *mi'croscope* to see them. This is an instrument that makes tiny objects look thousands of times larger. A drop of liquid containing some germs is placed on a thin glass slide and looked at through the microscope. Perhaps you would expect to see tiny plants with roots, stems, and leaves, or tiny animals with feet, heads, and eyes. But you do not see anything that resembles an ordinary

plant or animal. Some germs look like little circles, others like rods, and others have still different shapes.

For many years great men have studied about the germs that cause sickness. By learning how we

VARIOUS KINDS OF BACTERIA SEEN THROUGH A MICROSCOPE

These pictures are millions of times larger than the real bacteria.

can recognize the different kinds of germs, how they grow, how they produce illness, and where they live, we find methods of protecting ourselves against these enemies.

The mere presence of some kinds of germs does harm to the body; but like all living matter, the germs give off waste. The waste and the dead bodies of disease germs act like poison. The germs destroy the matter they live on by using it as food. This destruction of things is bad enough, but danger is added because where they grow they leave poisons.

**How Germs Grow.** — How do bacteria grow? A few bacteria appear in some living or dead matter, where everything is favorable for their growth.

The things which most bacteria like in a new home are filth, darkness, and dampness. Here each bacterium stretches out, grows longer, and then divides in half. Each half becomes a new bacterium. Each new bacterium soon divides in the same manner. Protozoa likewise grow and multiply rapidly. In a few hours a few disease germs (or other bacteria or protozoa) can multiply into a million.

Do the germs ever die? Yes, they die after a while if their food supply is exhausted, and many die when sunshine or fresh air strikes them. Cleanliness is one of the greatest enemies to germs. All bacteria must have food to live on; and many find their food mostly in dirt. When bacteria get on a tooth they live on the particles of food which have not been cleaned away with a toothbrush.

**How Germs Travel.** — Do germs remain in the home they have? No, many are easily carried to new places. Place a rotten apple in a basket of good and sound apples. In a few days you may find that some of the other apples have begun to decay or rot, especially those in contact with the rotten apple. Some of the bacteria that cause decay have spread from one apple to another. The same thing happens with germs that cause sickness. Suppose a person has a cold that is due to germs. The sick person coughs into the face of one who is well. The little drops of spittle which are carried with the cough to the face of the well person are

filled with germs. If some of the germs are taken into the nose or the mouth, they may multiply and cause the well person to become sick with a cold. This is what we mean when we say a sickness is catching. Catching, or contagious, diseases are some of the forms of illness that can be avoided; and we are going to learn later how to protect ourselves against the germs which cause contagious diseases.

**Where Germs Like to Live.** — Where do germs settle in the body? If we are in search of anything we should have some idea of where to hunt. If we know the favorite hiding places of germs we are better able to protect these places. Germs may live in any part of the body, but certain parts are better suited to them than others. It is our duty to take extra care in the cleanliness of those parts of the body to prevent the germs from using them for breeding places.

The commonest places for germs to settle in, when they first enter the body, are the nose and throat. Germs are often carried in with the dust and dirt floating in the air.

The skin on our bodies, especially on the hands and nails, is a common camping ground for germs. Here they can do little damage if we keep the germs from entering the body. This can only be done by constant and careful cleanliness, especially by washing the hands before every meal, because our hands

and nails come so frequently into contact with soiled things.

Germs of many varieties thrive on our hands and under the nails. If we forget and carry the germs to the nose or mouth, or even touch our food with dirty hands, we are in danger.

Think of a few of the things that boys and girls do which carry germs into the body. Here is a lead pencil. There may be swarms of germs on it. You can see why it is a bad habit to stick the point of the pencil into your mouth before writing. Swapping chewing gum and taking a bite from another's apple are unsafe habits. Using a common drinking cup is another dangerous practice.

DRINKING FROM THIS FOUNTAIN IS SAFE

Sore eyes are often caused by germs. They may come from using a towel which is not clean, or which has been used by another person who had germs on his hands or face. It is not safe to use a towel that others have used.

**Different Kinds of Disease Germs.** — There are many kinds of germs which cause sickness. Each of these causes a particular kind of sickness. One kind of germ causes measles; another, scarlet fever; another, diphtheria; and so each "catching" sickness has its own kind of germ. The germs increase in number in the body of a sick person, but they can do harm to others only when the sick person is careless.

COUGHING INTO A HANDKERCHIEF
The safe and proper thing to do.

When one has a cold, the nose, throat, and mouth may contain millions of germs. Coughing, sneezing, or spitting carries tiny drops or a spray of "secretion." In these drops are thousands of "cold" germs. If they land in the mouth or nose of a well person they may grow and cause another case of cold.

**Typhoid Fever Germs.** — In typhoid fever millions and millions of the germs leave the body when the sick person uses the toilet. If the sick person or those who take care of him do not have clean habits, some of the germs may get into food,

especially milk. Some germs may be carried from sewage into a supply of drinking water. Persons who drink the water or milk may get typhoid fever. Sometimes an entire family becomes sick because the sick person did not wash his hands well. He may have touched some food or dishes used by the rest of the family. New cases of typhoid fever can be avoided by proper disposal of all the body waste and by perfect cleanliness.

**Insects and Larger Animals may Carry Germs.** There are a number of insects and larger animals that frequently carry germs from one place to another. Flies have fine hairs all over their legs. The flies may walk over some filth which is covered with disease germs. The fly then goes on with these germs sticking to its legs. It may later rest for a while on some food that is soon to be used, or it may crawl over a baby's face, touching the baby's lips. At each place it leaves behind some of the germs that cover its hairy feet. Some people think only about the annoyance caused by flies and do not realize that the great danger of flies is that

A Fly, Life-size and Enlarged

they carry disease. It is well to swat flies or kill them in other ways. It is better to prevent them from breeding. They breed quickly wherever filth is found. Manure that is not placed in screened pits makes a breeding place for millions of flies.

Mice, rats, and other small animals, lice, bedbugs, mosquitoes, and other insects carry the germs of dangerous diseases. Rats and mice each year destroy much property and food. They sometimes cause fires by nibbling at matches. More often they carry sickness. Rats carry fleas, and sometimes the bite from these fleas may give the awful disease called "the plague." To-day many buildings are built of concrete and made rat proof. At the wharf you may see vessels from foreign countries with large tin disks on the ropes that hold the vessel to the wharf. These disks prevent rats from coming along the ropes from the vessel to the wharf.

Mosquitoes carry in their bodies germs of malaria or of yellow fever, and give them to people whom they bite. After this fact was known, some places where malaria and yellow fever once were prevalent were made healthful by the use of window screens, and the careful draining or spraying of the pools and swamps where mosquitoes bred. This is what made it possible to dig the great Panama Canal.

Here are some rules which it pays to remember and always practice: —

When you are sick, remain at home.

When you are about to cough or sneeze, use a handkerchief.

Don't spit except in a handkerchief or in a toilet.

After going to the toilet always wash your hands.

Never handle cakes, candy, or any food that any one is going to eat, until you have thoroughly washed your hands.

Partly eaten food should not be offered to other people.

Do not touch the rim of a glass, cup, or bottle with your hands.

Paper caps are placed on milk bottles to keep the dirt and germs out of the milk. Rinse off the edge of the bottle before you remove the cap.

### Helpful Things to Do

1. Look at a drop of milk under a magnifying glass or a microscope. Use some milk that has remained in the room over night.

2. Look at several other things that may have bacteria on them; for example, roquefort cheese.

3. Make a drawing of the bacteria you see.

4. In a certain city the manager of a street-car company has been thoughtful enough to place this sign in every car: "If you cough or sneeze, use a handkerchief, and protect others."

Suppose the good citizens of your school make a sign like this, and put one over the blackboard in the front of every classroom.

## Questions

1. What is the difference between good and bad bacteria?

2. Name some uses of good bacteria. Where do we find them?

3. Name a common sickness caused by germs.

4. How do germs increase in numbers?

5. What things kill germs?

6. How do some germs enter the body?

7. What do we mean by a "catching disease"?

8. How is illness carried from a sick person to a well person?

9. What insects may carry sickness? How?

10. Name some health habits that may protect us against germs.

## CHAPTER VI

## HOW THE BODY PROTECTS ITSELF AGAINST GERMS

**Some People Resist Germs.** — William is one of the popular boys in the school. He plays on the baseball team, and is a good track runner. William swims and takes part in all kinds of sport. He is active and healthy. His smile and happy disposition are admired by all who know him. When the school doctor examined William he said that the boy was in perfect health. Once some germs of diphtheria entered William's throat. The germs could not grow there; and William was not ill.

All the germs of sickness that enter the body encounter something which fights them and their poisons. The substance which prevents the germs from growing is stronger and more active in a well person than in a sick person.

Germs outside the body live best in damp, dark, and dirty places. Sunlight and fresh air kill germs. Only a few germs got into William's throat in the first place, because he spent a great deal of time in the fresh air and sunlight. Besides, because of William's good physical condition, his body made more of the wonderful substance that fights the germs.

What is this magical substance which the body uses to fight germs? In order to understand how the body protects itself, we must learn something about cells and about the blood.

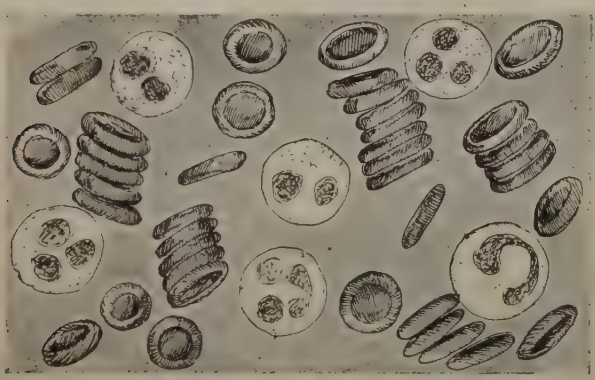
**The Cells of the Body.** — If you take a small piece of your skin and place it under a magnifying glass, you will find that it consists of hundreds of tiny, irregular pieces placed together. They look somewhat like the scales on a fish, except that they are very much smaller. Each of these tiny pieces is called a *cell*.

A cell is the smallest living part of the body. Every part of the body is built up of cells, like a wall built of bricks; but there are many different kinds of cells in the body. If you should look at a piece of your clothing under the magnifying glass, you would see thousands of threads, each made up of tiny fibers. Every part or organ of the body is made up in a somewhat similar way.

The cells differ in appearance according to the kind of work they do in each part. A muscle is

made of tiny, long, thread-like cells that can become longer or shorter as they are needed to work the muscle. The skin has flat cells like tiles or bricks in a pavement.

**The Blood Cells.** — The blood also has cells called *cor'puscles*. There are two kinds, white and red. These cells float in a liquid called *se'rum*.



BLOOD CELLS, GREATLY MAGNIFIED

A drop of blood under the microscope shows millions of them. There are many more red than white cells. This is why the blood looks red. Each of these two kinds of cells has its own work to do. The red cells carry oxygen to all parts of the body. The white cells fight enemy germs and try to destroy them. The serum of the blood contains a wonderful substance that helps to protect the body against poisons from the germs.

**How the Blood Fights Germs.** — When disease germs enter the body in any of the ways which we have learned, they may cause illness after getting into the blood. But in the blood, and even among the cells of the body, they are attacked by the white blood corpuscles. This ability of the body to fight disease germs and their poisons is called *immu'nity*. If the blood corpuscles win the fight, there are no bad effects. The blood is continually on guard, and is required to fight with some kind of germs all the time. The fluid of the blood often makes the poison from germs harmless. The blood of healthy people has greater power to fight germs than the blood of people who are weak or ill. They have better or more immunity.

How does the blood do its fighting? The blood is composed of a fluid stream in which red and white corpuscles float. The white corpuscles are the policemen of the body. They try to destroy most germs as soon as they find them. There are many places in the body which serve like police stations to house the white corpuscles. Here, too, new white corpuscles can grow quickly, and can be sent out, when needed, to help in a fight against germs.

In most cases the usual police force of the blood is ample to cope with the enemy. In some diseases doctors give serums to increase the fighting force of the body. The fluid part of the blood contains a substance which prevents the action of the poisons

that the enemy germs give out. The poisons are the waste products of the germs. All living bodies give off waste; and the waste from disease germs needs to be removed or made harmless. The ability of the blood to destroy germs and make the poisons harmless is one of the most wonderful powers of the body.

**How we may Help the Body to Protect Itself.** — It took many years of study and experiment for doctors to learn how the body fights disease germs. Now by a very simple and harmless method protection against some diseases can be given to people who do not naturally have it in their blood. The blood of a person is first examined to see whether he is protected or not against certain enemy germs. The doctor rubs a drop of fluid on a small scratch on the skin of the arm. The reaction of the blood to this fluid shows whether or not it is able to fight the disease. This can be done for several diseases, such as diphtheria and scarlet fever. If a person's blood shows poor fighting qualities for a certain germ, the doctor may with a small needle place under the skin a small amount of blood serum. This serum is the fluid part of some blood that is known to be a good germ fighter. It helps the body to make more of the white cells or police which are trained to fight that particular germ.

A horse is treated to make its blood a good fighter of diphtheria. Some of the serum of this horse is

used in cases of diphtheria and is called diphtheria *antitox'in*. This is used in small doses to prevent the disease, and in larger doses to cure it. Of course, prevention is the wisest and most satisfactory thing. Another kind of serum called *toxin-antitoxin* may be given before one meets diphtheria germs; and in three or four months the body will establish its own protection against diphtheria. Our bodies may likewise be protected against scarlet fever, typhoid fever, and several other diseases.

*Brown Bros.*

DR. EDWARD JENNER
He taught us how to avoid smallpox.

**Vaccination.**—Smallpox is one of the most dreaded diseases. Not only may it permanently scar the face, hands, and body; but it may cause total blindness, and frequently death. By rubbing a few drops of a certain *vaccine* (văk'sĭn) into a scratched spot on the skin of an arm or leg, causing a small sore which is followed by a tiny scar, this dreaded disease may be prevented. This slight operation is called *vaccina'tion*.

In the days of Dr. Jenner, over a hundred years

ago, thousands of people died from smallpox. Dr. Jenner noticed that many people who worked in dairies never took the disease. He investigated and found that these people were given protection through small scratches on their hands which were made sore from milking cows. The immunity of these people was found to be due to the fact that vaccine from the cow entered the tiny scratches and made the blood able to fight smallpox germs. From this discovery came vaccination against smallpox. Thousands of lives have been saved by this simple practice. Rarely has any one taken smallpox after having a successful vaccination. Since this discovery other great doctors have used similar methods to protect people against several other diseases.

### Helpful Things to Do

1. Prick your finger with a clean needle. A drop of blood will flow. Place this drop of blood under a microscope. Notice the red and white corpuscles.

2. Place a tiny, thin piece of skin under a microscope. Notice what a cell from the skin looks like.

### Questions

1. Why does a strong and healthy body fight germs better than a weak and under-nourished body?

2. What effect have sunlight and fresh air on the growth of germs?

3. What are body cells? How large are they?

4. Tell how the body protects itself against germs and their poisons.

5. How do serums and antitoxins help to protect us?

6. Name some sickness in which antitoxin is helpful.

7. How was vaccination discovered?

## CHAPTER VII

## AIR AND SUNSHINE: WHY WE NEED THEM

**The Work of Breathing.** — Did you ever try to count up to a million? Can you imagine doing the same thing over and over one million times? Either of these would be a very great task. Yet our bodies, each month we live, breathe in and out a million times. Without a minute's rest, air moves in and out of the chest, hour after hour, day and night. Twenty times each minute you may watch the chest rise as air is drawn in through the nose and throat. Each upward movement of the chest is followed by a fall of the bony cage, when air is breathed out.

Any work which nature insists on doing so often and so regularly must be important. What is the need for all this work? We shall soon see. The

body is the most wonderful machine in the world. In fact, it is more like a factory with many machines, each machine doing a special work, and each surrounded by countless workers. The work of mind and muscle is the product that each body factory turns out. The workers around each piece of machinery are the cells.

**Fuel Needs Oxygen.** — Each working cell is alive. Only live cells, like live workmen, can perform work. Each worker needs food and air. The food is the material used for building, repair, and fuel. The fuel is turned into heat and action or work; but fuel of any kind stored idle in a bin gives no heat or power. Coal or wood has to be burned in order to produce heat. It cannot be burned without air. A fire in a stove dies out if there is no current of air around the fuel. The fuel requires the *ox'ygen* that the air contains. One fifth of the air is oxygen. Without oxygen fuel will make no flame. Firemen take advantage of this fact in smothering a fire. They use chemicals which make large quantities of carbonic acid gas. This displaces the oxygen around the burning wood, and the fire goes out.

Sometimes a chimney is stopped up with soot, and when a fire is built in the stove or furnace there is only smoke. The fire is not getting enough air to give the oxygen necessary for a flame.

**The Body Needs Oxygen.** — In the body also the food stored in the cells should have the proper

amount of oxygen. When air is taken into the lungs it is separated by only a thin membrane from large quantities of blood. Some of the oxygen passes through the membrane into the red cells or corpuscles of the blood. Each drop of blood contains millions of these red cells. The cells are bright red when they are carrying a fresh supply of oxygen. The red cells carry the oxygen through all parts of the body. As the red cells pass near the other body cells they give them some of the oxygen. Carbonic acid gas takes the place of the oxygen which the red corpuscles have given up. Then the color of the blood becomes a dark red, and the blood is carried back to the lungs to exchange the carbonic acid gas for a fresh supply of oxygen.

**Purity of the Air.** — Air with its supply of oxygen is everywhere. It covers the earth and extends above it for many miles. Although air is so common and so free for all who want it, many people are in poor health and suffer for the need of it. The most important thing about the air we breathe is that it should be pure. Air that is pure contains the proper proportion of oxygen, and is free from poisonous gases, dust, and dangerous germs.

Many men have died from breathing the air in a closed garage where the engine of an automobile was kept running. One of the gases given off by the engine is a poison. If enough fresh air does not enter the garage, this poison may kill. It is

dangerous to run the engine of an automobile in a closed place. The same danger exists if we burn coal in a stove or furnace and do not have an open flue large enough to carry off the poisonous gases that are produced.

**Where Air must be Supplied.** — Men who soar miles above the earth in airplanes, or who work in deep mines, find that the air is very different from that at the earth's surface. The pressure or weight of the air is less at great heights above the earth, and greater at great depths; and in mines there are often poisonous gases. The effect of rarefied air is very serious unless additional oxygen is supplied. To secure this, aviators take tanks of oxygen up in their airplanes. In mines fresh air is pumped down through tubes. Even then the difference in air pressure on the body makes it impossible for men to remain long in high altitudes or at great depths below the surface of the earth.

**Sunshine a Purifier.** — Sunshine is helpful in keeping air pure by destroying germs. Sunshine is one of the best purifiers. People who are sick are often advised to take frequent sun baths because certain rays of light in sunshine are healthful. We have also learned the value of sunshine in preventing illness. Most germs cannot live or breed in sunshine.

**Sunshine Gives Life.** — Men and most plants and animals grow better and are healthier in the bright

sunshine. Plants in our homes, placed near a window, turn their leaves and flowers to the sun. If a growing fern is taken from the window and placed in a dark room it usually dries up and dies. You have noticed that florists build special houses in which to

FRESH AIR AND SUNSHINE WILL MAKE HIM WELL

grow their plants. These houses are termed hothouses or greenhouses and are built almost entirely of glass. No matter where the sun shines, the flower house is arranged so as to receive its rays. There is a wonderful power in the sun's rays, besides the heat, that produces health and growth in living things.

Every boy and girl welcomes spring and the opportunity to go out to play in the fresh air and sunshine. We greatly change our manner of living when the warm, sunny days of spring appear. We are out doors in summer more than in winter, both at our work and in the games we play. This is one

A Beach is a Favorite Summer Playground

reason why we have fewer colds and less influenza in the summer.

**Let the Sunshine in.** — You may have seen beautiful homes with large windows. These were built to permit sunshine and fresh air to enter freely. Instead, the windows may be covered with heavy curtains and draperies that shut out the sunshine. This practice is a mistake, as it shuts cheerfulness

and health out of the home. Again, some people pull down the shades to keep out the sunshine so that it will not fade the colors in rugs or furniture. Is it wise to save the colors in rugs and drive away the color of health from our cheeks?

### Helpful Things to Do

1. Let a pupil stand in front of the class. Watch his chest rise and fall. Each of these movements up and down makes one act of breathing. Hold a watch in your hand, and count how many breaths there are in a minute.

2. Problem: Find out why discharging the contents of a fire extinguisher on a flame smothers the flame.

3. Take two plants that are alike. Place one in a window for a week where no sunshine enters, and the other for the same length of time in a window where the sunshine enters nearly all day. Compare the two plants at the end of the week.

4. Place a burning candle in a jar for a few minutes. Notice what happens. Can you explain the cause?

### Questions

1. Why do we breathe? How many times a minute do we breathe in and out of the lungs?

2. Could we replace the oxygen in the air with another gas and still use the air for breathing? Explain.

3. What gases sometimes get into the air? Why are they harmful? Explain how these gases get into the air.

4. Of what value is sunshine to the air that we breathe?

5. Why do plants need sunshine?

6. Why do we need sunshine?

# CHAPTER VIII

## VENTILATION AT HOME, AT SCHOOL, AND AT WORK

**An Unventilated Room is Uncomfortable.** — On a cool and refreshing day in winter perhaps you enjoyed a walk from home to school. You entered the classroom ready for work. After an hour or so you felt dull and not able to work or think quickly. You wondered what made the change. Then you realized that the air in the schoolroom was dry and overheated. There was poor ventilation.

Oxygen is needed in the body to keep the body and brain cells active. The outside, fresh air supplies this need. The fresh air also circulates through

the meshes of clothing and helps to keep the body at a comfortable temperature. In a dry, overheated room with poor ventilation we become inactive and are unable to work or think as well as we should in a well-ventilated room. Besides, in an overheated room the body is surrounded by a warm blanket of air and cannot cool off. This gives discomfort. It is this condition that makes one restless in a room that is too warm. There is a desire to go out and cool off. You may have noticed that when you cover yourself with too many blankets at night you are unable to sleep well. The same discomfort exists in an overheated room.

**Natural Ventilation.** — Ventilation means changing the air or replacing the used air with fresh air. We are continually breathing air, or taking it into our lungs. Only when this air is fresh and free from poisonous gases does it supply our needs and make us comfortable. In naturally ventilated places the foul air is regularly displaced with fresh air. Air that is heated becomes lighter and is moved up when cool air, which is heavier, pushes under it. If you should stand on a ladder in a room you would notice that it is warmer near the ceiling than near the floor.

On a hot day in summer we are uncomfortable. A cool breeze may come and displace the hot air, and then we are refreshed. In very hot climates the people are not so active as in other climates,

where the temperature is moderate or cold. Winds or currents of air are produced by the fact that cool air is heavier than warm air, and will push along under the lighter warm air. It is this fact that makes ventilation possible.

If a chimney is filled with a column of cold air and we start a fire in the stove, the fire does not burn brightly but smokes until the chimney is warmed. The warm air in the chimney is then displaced by cool air that comes in through doors, windows, and crevices. This action of the air makes the draft that is necessary to keep the fire burning well.

**Ventilation Aids Breathing.** — The movement of air in and out of the lungs is called breathing, or *respira'tion.* The lungs are surrounded by a casing of muscles and bones. By the action of these muscles air is drawn into and forced out of the lungs. When the used air comes out it should be carried away to make room for new unused air to be taken in. Ventilation is necessary in a house or a schoolroom to keep the air pure.

**Ventilation Keeps us Comfortable.** — Not only is ventilation necessary to purify the air that we breathe; it is also necessary to keep the surface of the body comfortable. All machinery gives off some heat while at work. The actions of the body produce heat, but in excess of the needs of the body. The excess heat is disposed of partly through the

breathing, but mostly through the skin. Cooler air surrounding the body absorbs this heat and keeps the body comfortable. The temperature of the surrounding air, therefore, is an important factor for our comfort.

**The Right Temperature.** — It is a good plan to keep a thermometer in a room on each floor of your home, and to consult it frequently to see that the temperature is right. The most comfortable temperature has been found to be between 65 and 70 degrees. Some people have acquired the habit of being comfortable in overheated rooms. These people usually catch cold easily, because when they go out into the much colder air the body becomes too suddenly cooled and chilled. Such sudden changes of temperature are not healthful.

The temperature best suited to a school, home, or place of work depends upon the activity of the occupants. When we are active, a lower temperature is comfortable; but we require a higher temperature in a room where we are sitting at desks. When we are physically active the blood circulates more rapidly than when we are sitting still, and goes to every part of the surface of the body, keeping the surface of the body warmer; but when we are inactive the temperature of the surrounding air must be warmer to make us feel comfortable. When we exercise in a classroom we should open the windows wide to cool off the room. It is well known that

more and better work is done in a well lighted and well ventilated schoolroom than in a poorly lighted and poorly ventilated one.

**Some Moisture is Necessary for Comfort.** — The temperature is not the only thing that affects our comfort. Air should contain a certain amount of moisture to be comfortable. There is moisture in the air, even though you do not see it. When you blow your breath against a pane of glass the moisture in the air you breathe out is shown on the glass. The moisture in the air is in the form of invisible vapor. On a hot day when there is a great amount of vapor in the air we call it humid. On a humid, hot day the body cannot easily give off its excess heat to the air, and we are uncomfortable. If there is too little vapor in the air, making it dry, we are uncomfortable. In our houses we should try to keep the air somewhat moist. In most heaters there is a pan to hold water to give some moisture to the heated air. In steam-heated houses or apartments it is a good idea to keep a pan of water on or behind the radiator in each room.

**Ventilation and Heating.** — There are several ways of heating houses, and several different kinds of fuel. Hard or soft coal, wood, gas, and oil are the common sources of heat. Any source of heat may become a danger to our health, if not properly cared for. Besides the frequent overheating of houses, there is the danger that gases from burning

fuel may cause illness or even death. Usually we can detect coal gas or illuminating gas by the odor. There is another gas called *carbon monox'ide* that often cannot be detected by the smell. This is the poisonous gas that is given off from automobile engines. It may kill quickly. It sometimes comes from fuel that has not been fully burned. Sometimes defective gas heaters have caused death by this dangerous gas. Besides taking proper care of heaters and stoves, one should look after the chimneys to see that there is a good draft for the fire. Above all, the best safeguard is good ventilation of houses so that foul air and dangerous gases may be carried away. We should never sleep in a room with all windows closed, even on the coldest nights of winter. Most homes or dwellings have no special ventilating machinery, but are dependent upon window and door ventilation. Some halls, factories, and schools have fans and

THE BEST PLACE TO SLEEP IS OUT OF DOORS

blowers which force fresh air through the building or force out foul air.

**Outside Air is Best.** — While it is possible to get fresh air into our houses by frequent airing of rooms, the best fresh air is out of doors. People who spend much of their time in the open air usually have good health. Some people who are confined indoors all day make it a practice to sleep in the open air. This is healthful and requires only sufficient covering for comfort. Many cities have open-air classrooms for the benefit of children who are not very strong, or who have some kind of lung trouble.

When people work indoors all day they should not spend their spare hours or evenings in crowded places of amusement. Make it a rule throughout life to spend several hours each day in the open air.

**Modern Homes Provide for Light and Air.** — Compare some pictures of the first houses built with the houses of to-day. The first houses were caves or were made of mud, and had no windows for light and ventilation. This was not so bad as it would seem, because primitive people spent the day in the open air. The Indians who used tents kept an opening in the top for ventilation. They also lived most of the time in the open air. Although we spend a greater amount of time indoors than did the primitive people, we have modern houses that are built with proper arrangements for lighting and ventilation. The important thing for us is to see that we

use these arrangements to the best advantage during the time that we have to remain indoors.

**Guard against Dust and Foul Air.** — Dust is one of the dangers to our health. Dust comes from many sources, indoors and out. Disease germs are often found in it. Dust is carried by the air from place to place and enters our bodies as we breathe. We can realize how much dust is carried in the air by watching a sunbeam play across the room. In the rays of the sun we can see millions of particles of dust. When we blow the nose into a handkerchief we often are surprised at the amount of dust that has been breathed in and caught in the nose.

*Ewing Galloway*

CLEANING A BUILDING IN A LARGE CITY

In all cities the air contains much dust, dirt, and smoke. One can see how much dirt floats in the air and settles on things by looking at buildings

whose bricks were once clean and white. Look at the picture (p. 66) of the building being cleaned. Contrast the clean part with that not yet cleaned. We can imagine how the same kinds of dust and dirt enter the lungs or the passages to the lungs when we breathe. There is less dust and dirt in the country districts than in cities. Also the residential parts of cities have less dust and smoke than the industrial sections.

**How to Lessen the Amount of Smoke and Dust.** There are several ways of reducing the amount of smoke and dust in the air. Excessive smoke from chimneys can be prevented by using kinds of fuel, such as hard coal or oil, which do not produce much smoke; and by careful attention to stoking the fires. Much of the dust in cities can be kept down by proper methods of street cleaning. Streets should be sprinkled before sweeping, or street-cleaning machines should be used to flush the streets with water. People should also be careful not to shake or beat rugs or carpets in the open air in crowded sections of a town. In our homes we can also prevent much of the dust from reaching the air. When floors or carpets are swept with a broom, damp sawdust should first be sprinkled to catch the dust and hold it. Using a vacuum cleaner is a more hygienic way of cleaning houses than sweeping. Dust cloths should be dampened with a little oil. When ashes and refuse are placed outside for

collection, they should be in covered cans or boxes, so that they cannot be blown about by the wind.

**Danger from Gases.** — Besides dust and dirt, gases may get into the air and make it foul. Gas that we use for lighting and cooking is supplied to our houses through pipes. If there is a leak anywhere in the pipes or the fixtures, gas escapes into the air, and may do considerable harm. Frequently we read of deaths caused by breathing in gas.

We have learned that burning coal in a stove or heater that does not have the proper draft may give off dangerous gases, and that a running automobile engine in a closed garage has killed many people. There is one safe rule to follow: Have plenty of ventilation at all times. Fresh air scatters and dilutes the poisonous gases and prevents them from doing harm.

Garbage or any decaying food may give off foul gases that annoy us. Cleanliness in and around our houses helps to keep the air pure. Garbage should be in covered pails that do not leak; and it should be collected often or be disposed of by burning.

**The Use of Tobacco.**— Some people form habits that befoul the air that they and others breathe. Smoking tobacco is one of the commonest habits. Air filled with tobacco smoke is not good to breathe. Some smokers believe that they are not harmed by a moderate amount of tobacco. It has been proved that smoking tobacco does harm, to young people

especially, in several ways, and that people who do not use tobacco are more healthy than those who do. Tobacco does not kill germs as some people think. Runners and other athletes succeed better when they do not use tobacco.

**Why Ventilation is an Important Problem To-day.**— Many years ago people were not so much interested in the subject of ventilation as they are to-day. Most of the people then lived in the country or in small villages where there was plenty of pure air for everybody. They also spent more time out of doors than people do to-day. Now more than half of our people live in cities, and many work

*Ewing Galloway*

PLAYING IN CENTRAL PARK, NEW YORK

Playgrounds for children are needed in all large cities.

in factories, shops, and large office buildings. Millions of our people live in tenements on crowded streets, narrow alleys, or small courts, where there is little room for the circulation of air. Fresh air is so necessary for health that in some large cities entire blocks of houses have been torn down to provide a park or public square which serves as a "breathing space" for the people, and a place where the children can play in the open air and sunshine.

**Some Health Laws.** — In most cities there are now laws, or ordinances, to protect the people against befouling the air by smoke and dirt, and to provide for the proper disposal of ashes and garbage. There are also laws which require that buildings in which people live or work shall provide plenty of windows and other arrangements for fresh air and ventilation. Find out some of the laws of this kind that exist in your own city.

**Each must Do his Part.** — No matter how many laws there may be, people will not be helped much unless they know what to do to make their own homes healthful places in which to live.

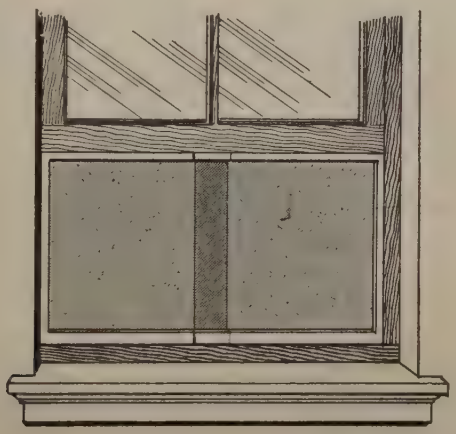
### Helpful Things to Do

1. Always sleep with windows open, summer and winter. Night air is as good as day air.

2. Freshen the air of the house by opening one or two windows in each room for a few minutes every morning.

3. If necessary, open a window occasionally during the day.

4. To avoid drafts use a few window ventilators. A ventilator screen of unbleached muslin, placed at the bottom of a window, is inexpensive and satisfactory. See sketch below.



5. If a stove or heater gives off coal gas, see that the condition is corrected at once.

6. See that garbage is placed in cans and kept covered, and always put out of doors.

7. Fill in all pools of stagnant water in the yard; and empty rain barrels, tubs, and cans of water that may be standing in the yard. These create foul odors and breed mosquitoes.

8. See that the cleaning in your home is done in such a way as not to scatter dust.

9. Dispose of rubbish, discarded pieces of furniture, old bric-a-brac, and other dust catchers.

10. Live out of doors as much as you can.

### Questions

1. Why is pure air necessary for health?
2. How is your classroom ventilated?
3. What do you do at home to keep the air pure?
4. Mention some conditions you have noticed at school or at home that need correcting.
5. What is meant by natural ventilation?
6. What is the right temperature for a room?
7. Mention two or three laws which exist in large cities to insure proper ventilation.
8. Why is it better to exercise out of doors than indoors?

# CHAPTER IX

## BREATHING

**The Habit of Proper Breathing.** — We can always have plenty of fresh air. We must make use of it if we are to have good health. The lungs work continually, taking in fresh air and forcing out used air. We have learned that the body requires a supply of fresh air about twenty times a minute (p. 51). We do not need to oversee this task. Breathing goes on without our assistance or thought. Good health, however, requires that we form no bad habits that may interfere with the important act of breathing. When we once form the habit of breathing properly we assist the work of the body and improve our health.

When we exercise, as in running, the body needs more oxygen; and this demand is met by an increase in the number of breaths each minute. When we rest or sleep there is less need for oxygen, so the breathing slows up. This is all done without our attention or assistance. We should form the habit of deep, full breathing at all times.

**What is your Chest Expansion?** — You can get some idea of how well or how deeply you breathe by measuring your chest expansion. Place a tape measure around the chest near the level of the armpits. Breathe as you usually do. Measure the size of the chest when you have breathed out and partly emptied the lungs, and again when you have breathed in and filled them. The difference is the measure of your chest expansion. Breathing exercises, especially in the open air, will increase your chest expansion. Look at the picture of the boy on page 79 taking these exercises. It is not necessary always to breathe as if you were exercising; but frequent breathing exercises help to form proper habits of breathing. Try taking breathing exercises each night before going to bed. Try this exercise: Stand erect, feet placed together, hands at sides. Inhale slowly, counting silently to ten, raising both arms as you count until they are perpendicular to the body. Then slowly exhale, counting to ten, gradually lowering the arms to the sides. Repeat for five minutes.

health of the body depend not only on the purity of the air that we breathe, but also on the way we breathe, on the condition of the nose, throat, and the other organs of breathing, and on our supply of physical energy. For this reason proper and sufficient food, and sufficient rest and sleep are necessary.

QUESTIONS

1. Why do we breathe more rapidly while running?
2. Why are daily exercises in deep breathing helpful?
3. Name two or three things that hinder good breathing.
4. What is the chief function of the lungs?
5. Why are sleep and rest periods necessary?

## CHAPTER X

## LIGHT, THE MAGIC LAMP OF THE WORLD

**The Precious Gift of Sight.** — In a small village in New England there lived a little boy. He could enjoy the songs of the birds and the sounds of music. He enjoyed the taste of food. He got pleasure from the fragrance of the flowers. He could put out his hand, stroke the fur of his pet cat, and enjoy its smoothness; but the greatest pleasure of all he did not have. He could not see. He was born blind. One day, when he was about eight years old, a kind and skillful doctor performed a delicate operation on his eyes. He soon could see that there was light all around him. This he had never before been able

to do. He had heard people talk about night and day, light and darkness, but those things meant nothing to him. Later the boy began to see objects and understand what they were. The birds and the trees and the beautiful flowers now became real. The ideas he now had of his mother and father and of his pet cat also were quite different from those he had before he began to see. He had never before known how beautiful the world is. The greatest of all gifts had been made his, — the sense of sight.

**The Gift of Light.** — In a deep, dark cave in Kentucky there is a stream with fish in it. The fish have eyes, but they cannot see. No light ever penetrates the cave to illuminate the waters where the fish swim.

In a totally dark room, filled with beautiful things, although we may have our eyes open, we see nothing.

There are two things, then, which are necessary for sight: — good eyes, and light.

Light may be natural light or daylight, or it may be some kind of artificial light, such as candles, gas, or electricity. With our modern methods of lighting it seems possible almost to turn night into day; but good daylight is always preferable for good vision. All daylight, even on a cloudy day, is caused by the light from the sun. At night, the moonlight is produced by the reflected rays of the sun.

**X-Rays.** — There are other kinds of "light" rays, different from those we can see. One kind of these mysterious rays is called *X-rays*. They pass through skin and flesh easily, but through the bones and some other parts of the body with more difficulty. Therefore they are used in making photographs of bones and organs in the body. The picture shown here is an X-ray photograph of the hand. You will notice how clearly it shows each of the bones.

X-ray Photograph of Hand

X-rays pass through flesh more readily than through bone. Notice the finger rings.

Doctors use these mysterious rays for many things. Organs such as the heart and stomach are watched to see how they work. The X-rays are used to locate any foreign body, such as a pin or button or bullet, so that it can be removed. If a boy falls and injures his leg, an X-ray picture will show whether or not the bone is broken. This is a great help to the

doctor, as without it he would have to depend on his sense of touch to find out the kind of injury.

**Things that Affect Lighting.** — If we could always have the full power of daylight in our homes, workshops, and schools, there would be no problem of lighting during the daylight hours. Our homes and other buildings are built with a varying amount of window area. Where the window area is sufficient to permit the natural light to reach all parts of a room, the lighting may be excellent. There are many things besides the size and number of windows which may prevent our having the full benefit of the light. There may be surrounding buildings, fences, or fire escapes which obstruct much of the light. In many homes heavy curtains are hung at the windows and permit only a small amount of light to enter the room. Some people do not seem to realize that window shades are mostly for the purpose of reducing the glare from direct sunlight, and that they should be raised when not needed for that purpose.

The color of the wall paper, paint, or woodwork is an important factor in the lighting of our homes. Dark colors lessen the reflection of light, and light colors increase it. Glossy surfaces, like varnished paints, may produce a glare harmful to the eyesight. The color of paper or paint on the ceiling should always be a white or a light cream tint. These light tints aid in illumination by reflecting more of

the light which enters the room. Outside the house, adjacent walls and fences may be painted white in order to increase the amount of light that comes into our windows.

Dirt and dust settling on walls, ceiling, and woodwork interfere with the lighting. For our general health, as well as for the benefit of our eyes, ceilings and woodwork should be kept clean.

**Light that is Too Strong; Glare.**—Things which should be a blessing may sometimes be harmful. Did you ever try to look directly at the sun? Your eyes tried to protect themselves from the glare by closing the lids to permit only a narrow ray of light to enter. Light which is too brilliant is harmful to the eyes. When the sun is shining in the regions of ice and snow, the natives protect their eyes from the brilliant reflected sunlight by wearing shields which permit only a small portion of the light to enter the eyes. People in these regions who go unprotected may suffer from a form of poor vision called *snow blindness.*

A mirror which reflects sunlight into the eyes is very annoying. Reflection of a strong light from a glazed or shining surface is a common cause of glare. It is often harmful to the delicate membrane of the eyes. There are many ways in which harmful glare may occur in school, at work, and at home. When we know where and how glare is produced we may avoid the danger. Highly glazed paper in books or

other printed matter, and highly glazed writing paper, are harmful to the eyes.

**Light in our Homes.** — If your father were going to rent or buy a new home, one of the first things he should consider would be how it is lighted. He should look for a house with plenty of windows, so that all parts of the new home would be well lighted during the day. He should also consider the surrounding buildings to see that they would not prevent the sunlight from entering the windows, and that there were no obstructions to prevent a free circulation of air around the house. In a house where there is an abundant supply of fresh air, daylight, and sunshine a family has the first essentials of health.

Correct Lighting

When we have good light it is important that we make proper use of it. It is wise to do our reading or close work near the windows, where we may have the greatest available amount of daylight. But do not choose this location if the direct sunlight is on your work.

Be comfortably seated in a position which permits the light to fall from the left. When one faces a window there is a glare on the pages of the book which is injurious to the sight. Reading in the fading twilight is also harmful.

**In School and at Work.** — In schools the desks should face a wall in which no windows are located.

*Ewing Galloway*

A Well-Lighted Factory in Cincinnati, Ohio

The windows should be on the left side, as shown in the picture on page 59. The shades should be drawn down only when and as far as needed to keep away the glare of direct sunlight. If the teacher assigns a pupil to attend to the shades,

he should see that they are always kept at the proper height. On dark days the artificial lights should be turned on to supplement the daylight.

In workshops the desk or bench should be located as near a window as possible. Where artificial light is used, the light should be shaded and at a height to be directed properly upon the work.

**Artificial Lighting.** — The greatest problem in illumination is that of artificial lighting. In the towns and cities where electricity is available, it is possible, with proper lamps and fixtures, to obtain ideal conditions. In the country one may have to use oil lamps. Candles do not give sufficient light. An oil lamp which is properly shaded to reflect light on the work may be a good source of light. Where artificial light is poor, it is safer to do most of one's reading and writing in daylight.

**Some Cautions and Suggestions.** — Lamps and gas produce more heat and require more room ventilation than electricity.

The dangers from the use of oil lamps should be known to every boy and girl. Because of the explosive character of the oil, one should not try to fill a lighted lamp. Lamps should be placed in a safe place where they cannot be upset or pulled off the table. Cats and dogs pulling playfully on a tablecloth on which a lamp is resting may upset the lamp and cause an explosion. Many years ago, a large part of the city of Chicago was destroyed by

fire, and thousands of people were made homeless, because a woman carelessly left a lighted lantern where a cow kicked it over. Oil lamps should be clean so that they do not smoke. The globe and shade also should be kept clean.

Gas light, whether from natural or from manufactured gas, may be made satisfactory by the use of modern burners. It is not so much the amount of gas burned that gives the best results, as the proper adjustment of the light. When used with a suitable mantle, gas may give good lighting.

In using gas for lighting we should always be mindful of the dangers of escaping gas. They cannot be emphasized too often. When lamps and stoves are connected with tubing, the tube may leak or may pull away from the gas pipe. It is better to turn gas off from the main fixture rather than at the stove or lamp, because the tube may have tiny holes which allow the gas to leak out into the room. Headaches may be caused by a slight leak in a gas tube; and we frequently hear of more serious results, even of deaths from illuminating gas escaping into the room.

It is possible to obtain too strong a light with some of our modern high-powered electric lamps. We may obtain a softer and more comfortable lighting from two 50-watt lamps placed in different positions than from one lamp of 100 watts. The height of the lamp should be such that not too

much of the light is lost before it reaches us. The kind of shade and reflector around a lamp is important. It makes a great difference, too, to keep globes and shades clean. Electric lamps gradually become dimmer with age and use. These should be changed before they are useless.

### Helpful Things to Do

1. Try standing in a dimly lighted room with closed eyes for a few minutes. Then open your eyes. What difference in your vision do you notice?

2. See if the lighting fixtures or lamps in your home are properly placed for giving the best light for reading.

3. Draw a diagram of a school room. Use an arrow to show in which direction the children face. Mark the side where the windows should be.

4. Name the different kinds of artificial lighting of which you know.

### Questions

1. What things are necessary for seeing?

2. What things should you consider in having your home well lighted?

3. Mention some dangers from lamps; from gas; from electric lights.

4. What uses are made of sunlight, besides lighting?

5. What uses are made of X-rays?

## CHAPTER XI

## WATER: ITS SOURCES AND USES

**Water Needed by All Living Things.** — Next to air, water is the most common thing in nature. We find it in our homes, where the mere turn of a spigot gives us all we need; or in the country, where a pump, well, or spring furnishes water. There is water in the ground and in the many rivers and lakes, and there is an unfailing supply in the vast ocean. Three fourths of the earth's surface is covered with water.

Possibly it is because water is so plentiful that some people think little of its value; but where there is no rain or water, plants, animals, and

L. G. W.



people cannot live. The lack of water is the reason why people do not live in the deserts, except in spots called oases, where there are springs of water and where all kinds of life are found.

**Water for Drinking.** — The first and most important use of water is for drinking. A large part of the body's weight is water; and water is needed in the work of almost all the organs of the body. This need must be supplied in ample quantities. It is estimated that at least six glasses of water are needed each day. One of the uses of water in the body is in furnishing part of important fluids, such as saliva and the other juices which aid digestion, and the fluid of the blood. The blood has waste products which are carried off by special organs in the body. These organs require water to aid them in carrying away waste from the blood.

**Your Supply of Drinking Water.** — Do you know where you obtain your supply of drinking water? Do you know how it is kept pure or made pure for drinking? Every good citizen ought to know. If you live in the country, study the ground around the springs or wells to see if any condition exists which may spoil the water supply. In the city, you should take a trip to the reservoir, or the pumping station, or to the artesian wells which supply the water for the city. You will see the enormous quantity of pure water there, and learn how it is protected from dirt and germs.

**Clear Water Not Always Pure.** — Pure water means water free from disease germs. Clear, sparkling water is not always pure water. Disease germs may get into the water to be used for

*Ewing Galloway*

PURE WATER FROM AN ARTESIAN WELL
The water comes a long way underground from higher land.

drinking. Part of the contents of outhouses may reach the water by seeping through the soil. The germs of certain diseases, such as typhoid fever or dysentery, may be carried by water. A water supply should be carefully watched at its source and along its entire course.

**Clean Bottles.** — When drinking water is placed in bottles, the bottles should be perfectly clean before being filled. Care should also be taken in washing milk bottles and cans. Typhoid fever has been spread by refilling milk bottles which had not been thoroughly cleaned. In one instance an epidemic of typhoid was traced to a farmer who washed his milk cans in water which had been infected with typhoid germs from a member of his family who was ill with the disease.

**Water in Food.** — Much of the food we eat contains some water, but not enough to meet the body's

FOODS WHICH CONTAIN MUCH WATER

demand. Certain foods, such as fruits and green vegetables, contain much water. They are especially healthful for that reason, and should form a large part of our food.

**In the Form of Ice.** — Water in the form of ice is useful to preserve our food supply, especially in warm weather and in hot climates. Ice preserves food because the low temperature prevents the growth of germs that would otherwise spoil the food.

**Keeping our Homes Clean and Wholesome.** — In most places where there is dust or dirt dangerous germs will abound. As you have already learned, many germs prefer the company of filth. Cleanliness is the greatest enemy of germs. There are also many kinds of disinfectants that are used to destroy germs and to prevent them from growing. The best way to dispose of germs, however, is to flood the home with sunshine, and to use plenty of soap and water on every object that can be washed. There is less danger of sickness in homes where soap and water are used freely to scrub away the dirt than in homes where dirt is allowed to accumulate.

**Simple Furnishings are Best.** — Homes which contain the least amount of bric-a-brac and elaborate furnishings are the easiest to keep clean and free from germs. The home should never be furnished in such a way that it is impossible to clean the floors and woodwork with soap and water without ripping up carpets or injuring draperies. If you have ever visited a hospital, you have probably noticed that the rooms are furnished in such a way that every part of the room and each article in it

*Ewing Galloway*

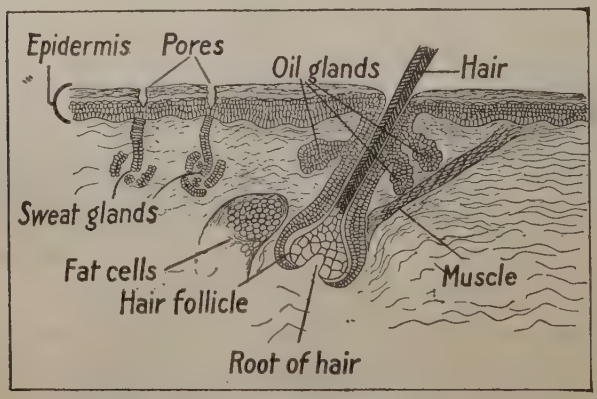
A Ward in a Modern Hospital

can be washed. The floors are usually made of hard wood or tile, and the furniture, even the bedsteads, are made of enameled wood or iron. There are no germ collectors; and everything can be easily washed with soap and water.

**Wear Washable Clothing; and Wash it.** — Of course you know good health requires that clothing, linens, and bedding should be washed frequently. Linens and bedding, and some clothing should be boiled. Whenever possible we should choose clothing which is washable. Unwashed clothing is a favorite lurking place for disease germs. This is especially true of underwear. Many people now wear cotton or linen outer clothing, especially in

summer, because it can be easily washed. Clean clothing is important both for our appearance and for our health.

**Keep the Body Clean.** — The skin is the outer covering of the body. It has glands which pour oil on the surface to keep the skin soft and smooth.




SECTION OF SKIN, GREATLY MAGNIFIED

The skin also has sweat glands which discharge waste matter from the body and serve as emergency valves for moistening the skin so as to cool the body. The temperature of the body is regulated by the lungs through breathing, and by the perspiration through the skin. Dust and dirt mix with the oil and sweat and clog the openings or pores of the skin. This prevents the skin from performing its function of removing waste matter and of regulating the heat of the body. A bath

with warm water at least twice a week is needed. In summer, when the body gives off more heat, perspiration also increases, and more frequent baths are needed to cleanse the skin and to aid in cooling the body. If the skin is dry and lacks its natural oil, a pure oil or cold cream may be applied.

One day a boy came to a hospital suffering from a painful skin disease. He thought he had been poisoned; and he had been, but not in the way he supposed. His entire body had been poisoned because he had not taken a bath in many weeks; and poisonous waste matter which should have been carried off through the pores of his skin had been absorbed into his blood. He needed a bath more than he needed medicine.

**Be Thorough in Bathing.**— You have probably seen boys and girls who think they are clean when their faces and hands have been washed. There are many children who seem to have an idea that if the parts of their body which are seen are clean, they are clean enough for all practical purposes. If you want to know whether a boy is thoroughly cleanly about his person, turn up the sleeves of his coat, or turn down the collar of his shirt, and if you find a dark ring around his wrists or his neck you can be very sure that this ring marks the end of the clean part of his body. There are also parts of the body which are often overlooked in bathing, but which need care just as much

as any other part. Such parts are the ears, the hair, and the nails.

Sometimes the accumulated dirt in the ears may interfere with hearing.

**Don't Forget the Hair and Scalp.** — The hair grows in tiny pockets or cups in the skin (picture, page 96). In these cups oil is held and is poured out and around the roots of the hair. This oil keeps both the hair and the skin smooth and healthy. If dirt is allowed to mix with this oily substance and clog up the pores of the scalp, the oil cannot perform its proper function of keeping the hair and skin smooth and healthy. Some children have been found who are so careless about washing that they have permitted scales of dirt to gather at the roots of the hair to such an extent that they have stopped up the oil ducts and prevented them from performing their work of keeping the hair healthy. Some cases of this kind have been so bad that the hair has failed to grow properly and has dropped out and left bare places on the

The Weekly Shampoo

head. Children who wish to have healthy scalps and a good head of hair should be careful to wash their heads about once a week. Pure soap and water are preferable to any hair tonic or hair oil on the market. When people get to the point of having to use a hair tonic they may have been neglectful of the more important duty of taking proper care of their hair when it was good.

**Unwelcome Guests.** — It is important to brush or comb the hair thoroughly and carefully at least once a day. Pride in one's personal appearance should be sufficient reason for this daily duty; but there is another reason why children especially should brush and comb their hair regularly. Unwelcome guests, called head lice, sometimes get into children's heads; and combing the hair is the best way to discover them. For this reason many mothers use a fine-toothed comb on the hair of their children every few days. Head lice breed in the scalps of people who do not keep their scalps clean; but they easily travel from the head of one child to that of another, especially in school. They also travel on hats and coats that are hung close together in cloak-rooms. Tiny white specks on the hair are the first sign of these vermin. These are the "nits," or eggs, from which the lice develop. Some people use salves and oils to destroy them. But prevention by the plentiful use of soap and warm water is better than any cure. Head lice will

not feel at home in a head that is kept thoroughly clean. For the proper cleaning of hair and scalp, use a pure soap, then rinse at least twice with plenty of water, and dry the hair thoroughly.

**Remember the Nails.** — The nails should not be neglected, either. Nothing adds so much to the appearance of one's hands as neat and clean nails.

WELL-KEPT NAILS

Many a boy or girl fails to secure employment or to receive a good recommendation because of the ill-kept condition of the nails. The nails grow rapidly and need to be trimmed about once a week; but more important than trimming nails is keeping them clean. Nails that have gathered a rim of black dirt not only look bad, but are dangerous to the health. Germs can very easily be gathered in with the dirt under the finger nails. Such germs may be carried on the fingers to the mouth, and in that way enter the body. It is important that the nails always be

kept clean by the use of a nail brush, soap, and warm water. A little stick of hard wood with cotton wrapped around the end is also useful to clean the nails.

**Hot and Cold Baths.** — We need to bathe, not only to keep the body clean and the skin healthy, but also for the stimulating effect which it has on the entire body. When you have taken a thorough bath and a rub-down with a coarse towel, notice the glow of the skin. This shows how much the bath has improved the circulation. Everybody should take a warm bath at least twice a week in winter, and oftener in summer, merely for the sake of keeping clean. In addition, a good many people take a cold bath, either a plunge or a shower bath, every morning, or nearly every morning, upon arising. A cold bath is most refreshing and stimulating but it should not be taken by those who feel bad effects afterwards. If a cold bath is followed by a feeling of chill or discomfort, it should be avoided. Almost everybody, however, can safely take cold baths in the summer, as the blood will react more quickly at that time and there is less danger of feeling chilled.

**The Towel is Important.** — A towel should not be used until all the dirt is washed from the body. You have probably gone into a bathroom and seen towels with finger marks all over them. That means that some careless person has rubbed his

hands on the towel before they were clean. Every one should have his own individual towel and wash cloth. Many a case of skin disease or of sore eyes is due to the use of towels or wash cloths that have been used by others. People now understand this danger so well that in most public wash rooms paper towels and containers are provided so that the towel can be discarded as soon as used. For the same reason there are also containers for liquid soap or for soap powder at many public wash basins, instead of the common cake of soap. It is unwise ever to use a common towel hanging in a public place or a cake of soap that others have used.

There is no better health habit than the habit of thorough cleanliness, — of the home, of the clothing, and of the body. The best way to practice this is by the regular use of plenty of water and soap. As was said at the beginning of this chapter, water is one of the most common things in nature. Make good use of it and you will be well rewarded.

**Swimming is Clean Exercise.** — Most boys and girls like to swim. Swimming is one of the most healthful exercises. It not only exercises all the muscles of the body, but keeps the body clean and refreshed while exercising. It is one of the best means of combining pleasure with exercise and cleanliness. In the large towns and cities there are usually public swimming pools, sometimes in the

*Brown Bros.*

A Public Swimming Pool

public schools, and sometimes in other institutions, which are usually open to boys and girls. It is generally required that a shower bath be taken before entering the pool. This is a very necessary precaution, for bodies should be clean in order to prevent the spreading of disease germs. Besides the swimming pools there are many other good places for swimming: in the ocean, in ponds, lakes, and rivers.

**Can you Swim?** — It is important that everybody should learn how to swim. Not only is swimming an excellent exercise, but ability to swim has saved the lives of many people, both of those who

could swim, and of others who could not swim but were saved by swimmers. There are some schools that consider swimming so important that they will not give graduation diplomas to children who have not learned how to swim.

**Water can be an Enemy as well as a Friend.** — As you have learned from this chapter, water is one of our best friends; it is free and plentiful almost everywhere, and is always ready to serve us. It can also be an enemy. If water is permitted to collect in pools on the ground, or to stand in open barrels, tubs, or cans, it becomes a breeding place for mosquitoes. One kind of mosquito which breeds in standing water carries the disease germs which cause malaria. Another kind of mosquito spreads yellow fever, which is a very dangerous disease in some foreign countries.

The best way to prevent mosquitoes from breeding in barrels and cans is to empty them. In places where the land is level and flat, and where there are stagnant ponds and ditches, mosquitoes are prevented from breeding by covering the surface of the water with oil.

When General Gorgas took charge of the sanitation of the Panama Canal Zone he found that it was hardly possible to proceed with digging the canal because so many workmen were ill with yellow fever and malaria. He knew the cause, — the mosquito. By draining the pools and ditches where

possible, and by the use of oil where draining was impossible, he soon made it as safe to work in the Canal Zone as in almost any part of the United States.

### Helpful Things to Do

1. Get two bottles or jars. Fill one with distilled water, or water from a spring, and the other with water from a faucet. Let them stand a day or two. Then look at the bottoms of the jars and see if there is any difference. Explain.

2. Arrange a party of members of your class to visit the reservoir and pumping station, or other source of your water supply. Write a composition on what you see there.

3. If you cannot swim, learn to swim as soon as possible.

4. If there are pools or cans or tubs of stale water in your yard, empty them. If you live in the country, and have a rain barrel to collect water for washing, see that it is covered.

### Questions

1. What different uses has the body for water?

2. Why is clear water not always pure?

3. Where do you obtain your supply of drinking water? Do you think it is a safe supply?

4. Why should bottles for milk and drinking water be thoroughly cleaned?

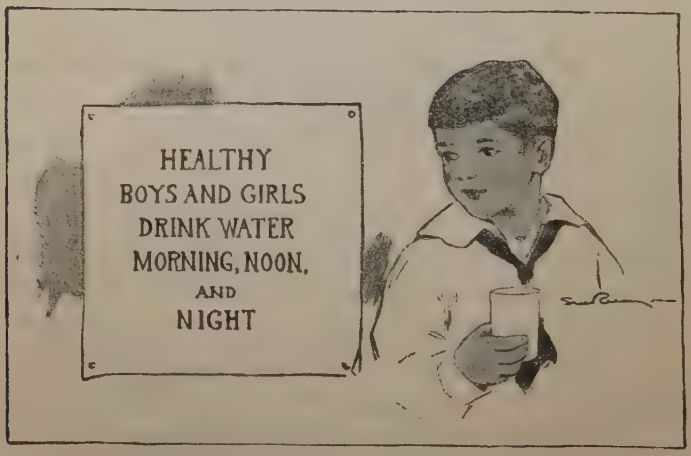
5. What is the advantage of warm baths? Of cold baths?

6. Why are paper towels safer to use in a railway station than a common cloth towel?

7. Why is swimming one of the best forms of exercise?

8. How long do you think a boy or girl should stay in the water when swimming? Explain.

9. Why were many workmen ill in the Panama Canal Zone? How did General Gorgas make it safe?



## CHAPTER XII

## SLEEP AND REST, THE BANK ACCOUNT OF THE BODY

**Banks and Bodies Need a Surplus.** — Everybody knows that we should not spend more money than we have. If we spend more than our earnings we may perhaps borrow, but what we borrow must be paid back. If we do not observe this well-known business rule, we become bankrupt.

The same rule applies to the business of healthy living. The cells are the coins of the body that we expend for work, activity, and energy. Every movement of a muscle, every thought, and every act demands its payment in cells of body and brain. It is a fact of simple arithmetic that we cannot take twenty away from ten before we add ten. The body not only needs food and fresh air to replace cells used up or spent; but, just as a bank must have surplus capital to extend its business and to be prepared for emergencies, so the body must create a surplus of cells for growth. There is one sure method of creating a surplus. This method is to conserve our energy and use fewer cells. One way to accomplish this is by rest and sleep. If we fail to have sufficient rest and sleep, there is a

gradual loss of strength and energy until some function of the body fails to operate, and illness results.

**Sleep is More Healing than Medicine.** — A little girl was very sick. Her mother asked the doctor if she should awaken the child from a sound sleep to give her food or medicine. The doctor told the mother to let her sleep, as it would do more good than the food. Sleep has carried many a patient through a crisis of serious illness. Once a man was very ill with a fever. During the height of his illness he fell asleep, and slept and snored loudly for twelve hours. His wife thought he was dying, and called the doctor. When the doctor came he said: "He isn't dying; he is getting well. Let him sleep."

**Conserve your Energy.** — No one, however strong and healthy, can keep working without sufficient rest and sleep. This fact is so well known that laws have been passed which tell how many hours an employer may keep boys and girls at work. This is for the purpose of providing the time that children need for rest, and relaxation, and sleep. Occasionally some people stay up late at night attending dances and parties, and lose needed sleep. This should not be done often, and the sleep lost should be made up as soon as possible. Some recreation is necessary; but pleasure should not interfere with rest and sleep when rest and sleep are needed more.

**The Young and the Old Differ.** — Healthy boys and girls are active and spend most of the day in work and play. Some boys and girls eat plenty of food but do not gain in weight or grow strong, because they fail to have enough rest and sleep. Older people require less sleep than children, because they are no longer growing and because they are less active. There is a danger, however, that as people get older they will become too inactive and not take enough exercise. This tendency results in an excess of fat. This excess is not of the same value as the development of muscle and other useful tissue which results from exercise. Excess fat does not add strength to the body. The proper amount of exercise and a suitable diet keep the body fit and prevent excess fat from accumulating.

**Relax as well as Sleep.** — Rest means relaxing. There is no better habit to form than that of completely relaxing or resting at intervals during the day. The person who has learned how to relax has no difficulty in sleeping peacefully at night. Restless sleep with disturbing dreams means that the mind is still active even during sleep. People who have difficulty in sleeping may induce sleep by a walk in the open air before bedtime. Many people find that a warm bath before retiring soothes the nerves and prepares the body for sleep.

Some men try to induce sleep by drinking whisky or other alcoholic liquors. Liquor only stupefies or

temporarily deadens the nerves. The after-effects are unpleasant and even more injurious than the loss of sleep would be. Men are likewise foolish to take sleep-producing drugs unless prescribed by a physician.

**Form Good Habits.** — Our sleeping habits may be made good or bad like any other habits. Here are pictures showing the habits of two different children. Which one are you like?

Mary is a school girl about ten years old. After the evening meal she helps her mother with the

MARY'S HEALTH HABITS

dishes. Then she plays outdoors for a while with her friends. Upon returning she quietly does a number of little tasks which she calls "bed-time duties." She calls them "duties," but she has done them so often that they have become easy

and pleasant; and she is hardly aware that she is doing them. She has a regular time for retiring. Cheerfully she goes to her room and undresses. She hangs up each piece of clothing where it can be aired. She brushes and combs her hair to keep it clean and healthy. She takes her bath. She carefully brushes her teeth, and rinses her mouth with cool water; then she takes a drink of cool water. Finally, she inspects her room to see that everything is in order. She opens the window at top and bottom, and spreads an extra blanket over the foot of the bed to use if it gets too cold. It is nine o'clock; the light is turned out; and Mary is soon asleep.

Morning comes; and, without the ringing of an alarm clock or the call of her mother, Mary is awake dressing, and making her toilet. At half past seven she enters the dining room with her usual smile and cheerful "Good morning." There is ample time for breakfast and a talk with her mother and father before she leaves for school. And she enjoys a pleasant walk from home to school.

The other picture is that of a careless girl. Let us call her Anna. She is about the same age as Mary. The evening meal is over, and Anna rushes off to play with her friends. She forgets about the time and when she returns home she is surprised to hear her mother inform her that it is almost nine o'clock. Her mother excuses her because she says

she was having a good time and didn't know how late it was. She rushes to her room and a half hour is consumed in dawdling and aimlessly tramp-

ANNA'S HABITS

ing around the room. Her mother calls up to know why she has not gone to bed.

"Going" is the answer.

Watch her go. She throws various articles of clothing on the floor or near-by chairs. Then she puts out the light and jumps into bed.

A little later her mother enters the room, picks up stray clothes, and replaces a wrinkled dress and soiled stockings with clean ones. She opens the window and glances at the bed. Anna is not asleep yet. Her mother asks if Anna has brushed her hair and washed her hands and face; but Anna says that she was so tired she forgot it.

Morning comes; and at seven o'clock and every ten minutes thereafter mother's voice is heard calling, "Come, get up, or you will be late for school." After eight a tired girl, carelessly dressed, and yawning because she did not have enough sleep, rushes into the dining room. She is ill-tempered and has very little time for breakfast. She hurries to school, and rushes into the hall just as the last bell is ringing, wishing that school began an hour later.

Follow Mary and Anna into later life and you will see that the same habits which they formed as children continue. There is no doubt which one is healthier and happier.

**A Doctor's Advice.** — The following advice is from a doctor who is frequently called upon to treat both children and grown-ups for troubles caused by lack of sleep: "Night is the time to sleep, so that the body may retain its strength and usefulness. The amount of sleep needed is from twelve hours for a very young child to eight hours for a full-grown man or woman. If a person takes an afternoon nap of one hour, he may retire an hour later. But you cannot substitute day for night. For a child night is the proper time for rest and sleep."

Boys and girls should have at least ten hours of sleep every night. Much sleep is necessary because they are growing rapidly, and many new cells must be formed as well as old ones repaired.

### Helpful Things to Do

1. For one week put down on a paper the time you go to bed and the time you arise. Are you getting sufficient sleep and at the right hours?

2. Make a list of the duties that you do before retiring and upon arising. Have you omitted any important ones?

3. Look at the members of your class for several mornings, and see if you can tell which ones have had sufficient sleep.

4. Imagine that you are a doctor, and write a letter to a boy or girl ten years old giving helpful advice about rest and sleep. Put in as many good suggestions as you can.

### Questions

1. Why does the body require surplus strength or energy?

2. Why is sleep better than medicine?

3. How do young and old people differ in the amount of sleep required? Explain.

4. Why do you think that Mary will be happier and healthier than Anna?

# CHAPTER XIII

## WORK AND HEALTH

We hear a great deal to-day about "industrial hygiene." People are beginning to understand that certain trades or occupations are injurious to the health of the workers, and that certain industries affect the health of the community in which they are situated. For that reason industrial hygiene is a subject of great importance.

**Some Dangerous Occupations.** — Work may be either physical or mental. While there may be mental work with little or no physical effort, most physical or manual work requires some mental

effort. Each kind of work has its own dangers or hazards to health. The mental worker may not take enough physical exercise in his spare time and hence may suffer from some of the ills due to lack of exercise. The laborer may be exposed to some accidents which are peculiar to his particular kind and place of work. The man working on roads and railroads is exposed to sunstroke, or to injuries from vehicles, from machinery, or from blasting. Those working on bridges and high buildings are in perilous positions. In trades such as paint mixing and the making of storage batteries, there is danger of lead poisoning. Power-driven machinery adds a toll of deaths and injuries. Dust from materials such as wool, and from coal in mining, often has bad effects on health. It is possible to make most occupations much safer by observing rules of hygiene and safety.

**Care in Choosing an Occupation.** — Each person in choosing his occupation should consider its healthfulness, as well as his own inclinations. While some of us are more fearless than others and would ignore minor dangers, we should not choose an occupation which we know will directly endanger our health. Many occupations which were considered unhealthful a number of years ago are now fairly safe. This is due to a better knowledge of the causes of illness of workers. As a result, laws have been passed to protect workers in various

industries. Inspectors are employed in most states to see that these laws are enforced. Safety depends as much on each worker as on the laws.

**How One Occupation is Made Healthful.** — If you ever visit a factory where paint is made you will realize how careful the workers in some trades must be. If the men who make paint do not observe the health rules, they may soon be ill. Lead is used in making paint. Lead is poisonous when it gets into the body. While the workers are mixing the paint some of the lead sticks to the hands and clothes. If these men were to stop work at noon and eat their lunch without washing their hands and faces, and without removing the paint-covered clothes, they would carry some of the dangerous lead into the body with the food they eat, and would soon feel the effects of the poison.

To keep the men well and fit to work, the paint factory has plenty of wash rooms and even shower baths. There are lockers to hold the street clothes while the men wear special clothes for work. These workers are taught what cleanliness and care mean to their health.

There are many other kinds of work that have some risks to health for those who do not heed the rules laid down for their safety.

**Work and Keep Well.** — Work is a necessary part of the life of each one of us. We can make it a source of pleasure and satisfaction or a care and a

burden. People who say they are "working themselves to death" are usually doing so because they are ignorant of the laws of health, or are disregarding them. They are harmed more by not knowing how to live and work than by the amount of work they do.

HEALTHFUL WORK

No matter what work is given to us, whether it is study in the classroom, or work in a factory, we should do it cheerfully. Fretting and worrying are harmful to the nerves. The boy and girl who do their work cheerfully have discovered one of the secrets of health and success.

After you are old enough to leave school, try to find the kind of work that you like. Then learn all you can about the occupation. Find out if there are any dangers to your health, and also how these dangers can be avoided. In most work there are no special dangers; and by observing the health rules you have learned at school you will be able to keep yourself healthy.

People who have a regular occupation every day,

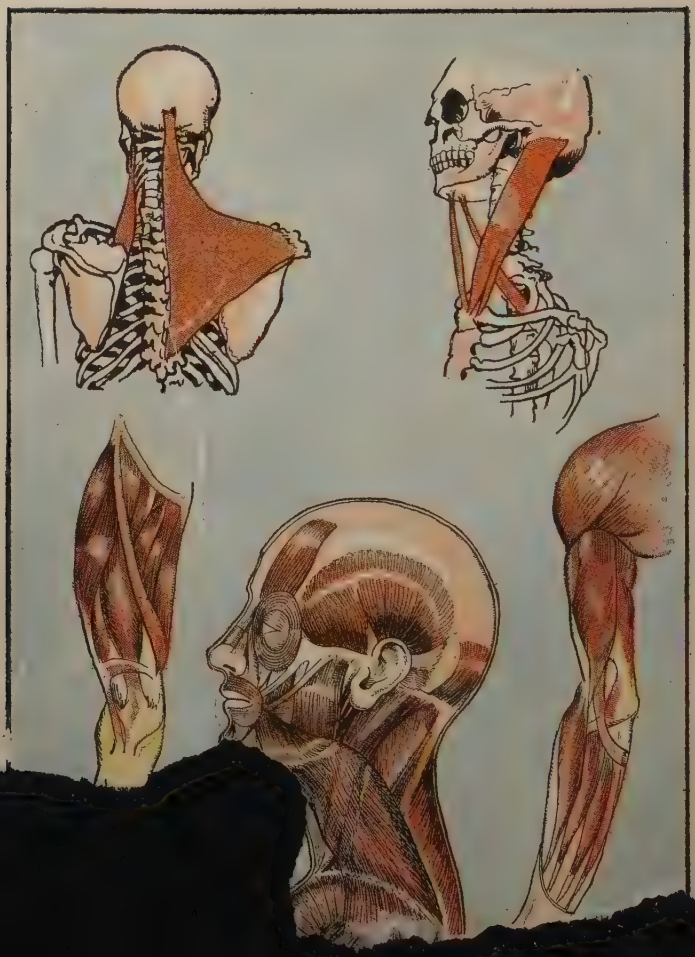
and who observe the rules of hygiene, are healthier and happier than idlers. Work is good for health. Tramps are usually neither healthy nor happy people. Many of the trouble-makers in school and in the world everywhere are people who have little else to do but to disturb others. You have probably heard that to "mind one's own business" is a useful habit. But it is first necessary to have a business to mind. School work is a business just as much as carpentry or bookkeeping. Boys and girls in school should form the useful habit of attending to business as they must do when they take up a regular occupation in later life.

### Helpful Things to Do

1. Make a list of eight or ten dangerous occupations, and explain why they are dangerous.

2. Tell how these occupations may be made safe by the enforcement of certain rules or laws.

3. Write a composition o[illegible] "[illegible] work I should like to do wl[illegible] reasons why you would like [illegible] there are any particular da[illegible] the [illegible]



5 Grade

## CHAPTER XIV

## EXERCISE FOR HEALTH

In the Orient there are some people who have a strange belief which requires them to suffer bodily pain or exhaustion in order to display proper religious zeal. Some of them fast for many days; others stretch their arms towards heaven for so long a time that they can hardly move them, and the muscles of their arms become almost useless.

Perhaps you have seen a person who has been confined in [illegible] many weeks because of illness. When he gets up he cannot walk at first, and can hardly stand. The reason why the Oriental zealots cannot move their arms is the same as the reason why the sick person cannot walk. The muscles

have been unused for so long a time that they have lost their strength.

The muscles are the parts of the body which enable us to move. They are somewhat like cords or strands of rope, made up of very fine fibers. The red meat that you eat at the table is the muscle of the ox or the sheep.

**Muscles Need Nourishment and Oxygen.** — In order to move and do their work the muscles need food, just as a machine needs power from the fuel under the boiler. When we eat food, part of it is sent through the blood to the cells that make up the muscles. When they move or do any work they use up the food and call for more. The more work done by a muscle, the more food it consumes. The cells of the muscle also need oxygen. The oxygen is needed to burn the food in the cell and produce the power, just as oxygen is needed to burn the fuel under the boiler of a locomotive. When you run in a race, and use your muscles vigorously, you breathe faster, or more times a minute. This is because the body has called for more oxygen and you are trying to supply the need by taking in more air.

**The Need of Exercise.** — Besides nourishment, muscles need regular use, or exercise. Many boys and girls think of exercise only in connection with running, or jumping, or school drills; or perhaps in connection with such games as baseball, football,

and basketball. These are called organized or systematic exercise, because they are governed by set rules. The boy who chops wood and runs errands, and the girl who sweeps, dusts, and dries the dishes, are also exercising. In fact, when we stand up or sit down, or write, or even smile, the muscles of the legs, hands, or face are in action, and are being exercised.

If one wishes to have a well developed body, it is necessary to give some exercise to all the muscles. A blacksmith has well developed muscles in his arms from using them constantly. If he used only the anvil and hammer, some of the other muscles would be neglected and would be flabby; but the blacksmith bends over to shoe a horse, walks to and fro, and does many other acts that develop many of his muscles.

If a boy should exercise only by swinging a pair of dumb-bells, he would develop mostly the muscles of his arms. In a gymnasium one is taught a varied set of movements of arms, legs, and body in order to exercise all parts. Some forms of exercise are more healthful than others, as they provide work for many groups of muscles at the same time. For this reason swimming is one of the best forms of exercise.

**Value of Exercise in the Open Air.** — Strenuous and active exercise demands an ample supply of oxygen, because of the deeper, more rapid breathing

which results. Therefore, active exercise is more beneficial if taken in the open air, which is purer and fresher than any inside air can be. For this reason teachers of physical training, even in schools

*Brown Bros.*

BOYS EXERCISING IN AN OPEN-AIR GYMNASIUM

that have good gymnasiums, have the pupils exercise on the playground whenever the weather will permit.

There is no reason why exercise should not be taken out of doors even in cold weather. In fact, there is hardly any place in the United States where outdoor exercise is not possible for at least three fourths of the year. Once an eminent physician was asked why he was able to take a two months' vacation in the summer. He replied that most of his patients did not need his services in the summer,

because they spent so much time in the open air. The chief reason why boys' and girls' camps are such healthful places is that the young people live out of doors all day, and sleep at night with the tent flaps or sides of their cabins open.

**Exercise Strengthens the Heart and Lungs.** — Exercise not only keeps the muscles of the limbs and body in good condition, but also strengthens the muscles of the heart and the organs of breathing.

ROWING IS GOOD FUN

Full and rapid breathing develops the muscles of the chest. The heart pumps blood more freely when we exercise, and serves all parts of the body better. We notice the healthful, pink color that comes to the skin after active exercise. This is due to the fact that the blood, rich with oxygen, has been driven even to the smallest vessels at the surface of the skin.

**Exercise Improves the Appetite.** — You may recall a time last summer when you were out of doors all day. Perhaps you went swimming, rowed a boat for an hour or more, or perhaps you went for a long hike. When you returned you remarked how hungry you were. Exercise, especially in the open air, creates an appetite for food. Much waste product in the body has been carried away in perspiration and breathing. The body cells have used up the food that was eaten before and are calling for more food. After such exercise one has no difficulty in sleeping soundly. This is due to the desire for rest after exercise, and to the general healthy condition of the body which has plenty of exercise.

**Provisions for Exercise.** — Cities and towns appreciate the need of special places where the people, especially the boys and girls, may go for recreation and fresh air. For this reason there are parks and playgrounds in different parts of the town. Most schools have playgrounds around or near the buildings. These playgrounds should be large enough to give plenty of room for every one. Some states have a law that no school may be built without at least thirty square feet of playground for each pupil. Under this law what would be the area of a playground for a school of 850 pupils?

Some cities, as you have learned, also provide public swimming pools, where all boys and girls may have a most refreshing form of exercise, and

*Ewing Galloway*

RECREATION GROUNDS IN A CITY PARK

also learn how to swim. Most colleges, and many public and private schools, have swimming pools, and make swimming a regular part of the course of study. It is unusual to find a college that does not have a large athletic field that affords ample space for all of the popular outdoor exercises, games, and competitive sports. Many large high schools also have athletic or play fields. In some places where land is not very expensive there are schools that have twenty or thirty acres of ground so that

*Ewing Galloway*

PLAYGROUND AT A PUBLIC SCHOOL

every kind of open-air exercise may be provided for all the pupils. In a certain city the pupils of the high school and their parents recently made a city-wide drive for a fund of $400,000 to purchase and equip a community play field where children

of all ages, as well as grown-ups, might always have a place to play games in the open air. The people of this city understand the value of recreation so well that they soon subscribed the full amount.

A Hiking Club

**Hiking is Good Exercise.** — Hiking, or walking long distances in the open air, is a very popular exercise. There is probably no other form of exercise in which health, pleasure, and education can be more easily combined. It is particularly pleasant if a group of friends go on a hike together. Hikers not only get a valuable form of exercise, but also see new things, new scenery, and learn interesting facts about nature. In some schools there are hiking clubs that take a hike every Saturday. Interesting collections are sometimes made on these

hikes. For instance, one Saturday a hiking club in a school in Pennsylvania took a ten-mile hike up a river valley and brought back a dozen Indian arrowheads for the school museum.

**Good Sportsmanship.** — Organized play and games are usually good exercise, and they also develop useful traits of character. Fair play, honesty, coöperation, and respect for rules are developed in organized games. To-day it is a great compliment to be called a "good sport." It means that one is a good loser, as well as a good winner. Nobody likes a "poor sport." Everybody admires a player who takes defeat cheerfully and who takes victory modestly. Aren't you glad when your school team, if it loses a game, cheers the winners?

**Avoid Overdoing.** — Can we get too much exercise? Up to a certain point exercise benefits the muscles and organs of the body. If we exercise beyond our capacity, it is harmful. Any one who has never run a mile, and attempts to do it, will be exhausted before he finishes the race. The boy who seldom plays a game of baseball or football has sore and painful muscles for days after a game.

Contestants in athletics prepare for the final test by weeks of training. They gradually accustom the body to meet the extra strains to be made upon it. Runners first run slowly and go only a short distance; then they rest. The speed and the distance are increased gradually so that there is no

excessive strain. Sudden spurts are likely to overtax the heart and lungs and cause permanent injury, unless the contestant is carefully trained for the work.

**Fatigue is a Warning.** — Fatigue, or being completely tired out, in any form of exercise, is a warning to stop and rest. If we go beyond this point, exercise is more harmful than beneficial. It is wise to rest after active exercise. We should not reach the point of fatigue, but should find out how much we can safely do. Unless one is trained for certain vigorous competitive sports, it is well to choose kinds of exercise better suited to one's physical condition, such as walking. In a certain high school regular daily exercises in gymnastics are required. The teacher of physical training, however, understands the danger of strenuous physical exercise for those who tire easily. He excuses students who have weak hearts, or who have recently had a severe illness, such as influenza or pneumonia, and requires them to take a daily walk in the open air as a substitute.

It is well to have a physical examination, especially as to the condition of the heart and lungs, before entering athletic contests. Such a test, with the advice of a doctor, may prevent serious damage to one's health.

The following is a list of some of the more common athletic sports which require great effort and

should be engaged in only after an examination of the heart, and after the contestant is found to be in good physical condition by a physician.

| | |
|---|---|
| Football | Basketball |
| Sprinting | Boxing and wrestling |
| Long-distance running | Tennis |
| Contest swimming | Volley ball |

**Do Not Exercise Vigorously After a Meal.** — You should not take active exercise or play strenuous games immediately after a heavy meal. At this time the energy of the body is needed to digest the food, and the body cannot spare additional energy for exercise. Occasionally we read in the papers about a man dying from acute indigestion while swimming. Such tragedies often result from swimming too soon after a meal. One should wait at least an hour and a half after eating before swimming. It is also unwise to take active exercise when fatigued after several hours of hard work. Here again the body cannot meet the strain placed upon it. Some light exercise, such as a short walk, is more beneficial.

**Being a Spectator.** — To-day many colleges and public schools have athletic fields and stadiums for football, baseball, and other athletic contests. Thousands of people attend the games in these stadiums. One large city has recently opened a public stadium that will seat 100,000 people. Do

boys and girls who merely sit on a bench and watch the game get much benefit? To be sure, they are out in the open, breathing fresh air. They exercise their lungs by cheering. They develop school spirit by encouraging their team. These things are beneficial. But do their muscles get much exercise?

*By C. P. Cushing from Ewing Galloway*

THE YALE BOWL

Football games and athletic contests are held here.

Can you think of some way in which all would be more benefited? Discuss this problem in your class.

**Effects of Alcohol, Tobacco, and Drugs.** — What are the effects of alcohol and tobacco on athletes? Ask any physical trainer what is the first and most important advice he gives to those who desire to enter contests. He will probably say: "Don't touch any alcohol or tobacco." Alcohol interferes with the supply of oxygen that the cells of the body must have. Tobacco interferes with proper breathing;

and its excessive use, especially by young people, weakens the heart. It has been proved that those who are users of alcohol or tobacco are rarely successful athletes.

Much worse than tobacco are narcotic drugs — "dope" and the like — that are sometimes taken for fun, by persons who do not know that the drug habit is very hard to break and often leads to terrible sickness and insanity. Any one who cares to succeed in athletics, or even to be healthy and happy, will use no drugs except those prescribed by a physician.

### Helpful Things to Do

1. Bring a picture showing a good place in which to exercise. Tell why it is a suitable place.

2. Is there a public park or playground in your community? If not, try to get your friends interested in making one.

3. Try running every day: at first a short distance, then a longer distance. At the end of a week see what improvement you have made in distance without fatigue.

4. Find out whether or not there is sufficient playground around your school. Divide the area of the playground in square feet, by the number of pupils.

5. Make a list of the games that you play for exercise. Which is your favorite game? Why?

6. Form a hiking club in your school.

## Questions

1. What are muscles? How does exercise benefit them?

2. Name some exercises or games which use several sets of muscles. Explain.

3. Why is open-air exercise especially good?

4. How does exercise benefit all parts and organs of the body, internal and external?

5. What does your community do to encourage exercise and health?

6. How is it possible to get too much exercise?

7. How do you know when you have overdone?

8. Why should one have a physical examination before entering a severe contest?

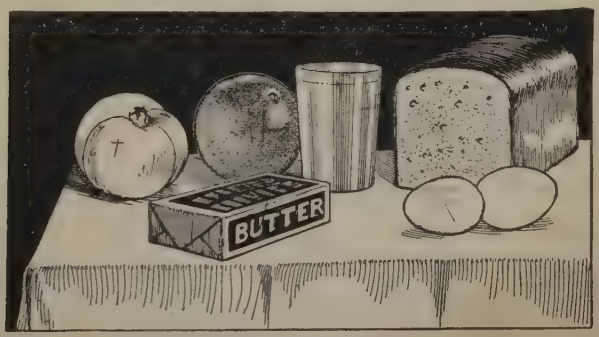
## CHAPTER XV

## FOOD AND HEALTH

**Ignorance Causes an Accident.** — A town spent a large sum of money to build a bridge across a stream. The people were proud of the steel structure, which it took a long time to plan and build. Soon after it was completed and placed in use some heavily loaded trucks started to go across. The beautiful bridge collapsed and several people were killed. An investigation showed that one of the main steel girders was defective. There are different kinds of steel, different qualities or grades, according to the material used, or to the way in which the different materials are mixed. The steel which supported this beautiful bridge had been made partly of poor material.

Similar conditions exist in the body. The material for building the body is food. The strength and usefulness of the body depend in a large measure on the kind and proportions of the various foods which are used to build it. If we are to have no accidents or breakdowns, and are to be of the greatest amount of use, we must be careful in selecting the kinds and proportions of food material for the body.

**We should Know Food Values.** — Foods vary in kind and quality according to what they contain. Some are for body building or repair of structure; some furnish heat and energy; some are for body regulation; and other kinds may help in special functions. Most foods are mixtures, and are suitable for several of the above uses. Unfortunately,




HEALTHFUL FOODS

most people take no interest in learning the values of the foods they eat. The men who built the bridge which collapsed believed that steel was steel. They did not take the trouble to see that the proper kind of steel was used. If we are to use the proper kind of food we must know its contents and value.

More money is spent to-day in advertising food products than in advertising any other thing. About one third of the advertisements we see in cars and on fences refer to foods. Of course the

advertisements are intended to make the food products attractive because the food is for sale. Some of the things said in the advertisements are true, but we do not need to be misled by false or extravagant claims of food manufacturers. We can easily learn how to select wholesome and nourishing food.

**Sources of Food.** — All living things — human beings, animals, and plants — must have food in abundance in order to exist and enjoy life. This need is supplied in all parts of the world which can be inhabited by living things.

Nature has provided a supply of food by using the elements of which the world is made. Sunlight is the great energy giver. Rays of light containing energy are used by the plants. The plants take in through their roots water and minerals from the earth. They also take from the air certain gases. In this way energy and fuel are stored in plants. Both people and animals eat the plants as food, and from them secure fuel and energy. Some animals act as storekeepers. By eating the plants, they store a food supply in their bodies until man uses their meat for food.

Man's food, therefore, comes from sunlight, air, earth, and water, mainly through plant life and through animals. The food which we eat exists in mineral, vegetable, and animal forms, as in the case of salt and water, vegetables and fruit, and

meat, milk, and eggs. Many food elements are changed for us in the bodies of plants and animals. The cow grazes in the meadow. The grass that she eats is converted into the milk which the cow gives us to drink. The grass and other vegetation that an animal eats are likewise converted into muscle

SUNLIGHT, WATER, EARTH, AND AIR ARE FOOD FOR PLANT LIFE

and fat. Then the animal may be slaughtered, furnishing meat for the table.

Plant and animal foods contain much water, but not enough to meet the daily needs of man. Everybody needs at least four glasses of water a day.

**How Food is Made Attractive.** — Animals such as cows and sheep can eat grass and other plants without any cooking or seasoning, but we can eat only a few plants raw. The cow and sheep can eat

raw plants because they have stomachs which are different from ours and are able to digest such foods. Most animals are not so particular as people are about the appearance or taste of the food they eat.

Why should we be so particular about appearance and taste? Man has found that food which is nicely cooked and tastily prepared is more inviting, and more digestible. Before food is swallowed, it should be thoroughly chewed and moistened. Some animals can swallow large unchewed masses of food and succeed in digesting it. We have teeth for fine chewing, and a number of sensitive spots, chiefly along the sides and back of the tongue, for tasting food. These tiny spots are called taste buds. The sense of taste tells us whether a thing is salty or sweet or sour. Nerve messages from the tongue to the brain tell us whether the food tastes good or bad. Often, too, the smell of a food will tell us whether or not it is good. Our mouths may "water" because our nerves notify certain glands of the mouth which produce saliva. They also notify glands of the stomach to get ready for some good food. If we want to enjoy the food, we try to get all the taste we can by thoroughly chewing and moistening it. The pleasure of eating is an aid in digesting the food.

When food is properly cooked, smells good, looks good, and tastes good, it creates an appetite, or a

desire to eat. That is one reason for cooking and seasoning food. To create an appetite, the makers of food often mix many kinds, add things which season and sometimes color the food, and serve it in pretty boxes and cans. They know that by creating an appetite they increase the sale of their product.

**Kinds of Food.** — When an architect or builder plans to build a house he selects the kinds of material that will make it strong and useful. The architect indicates the material best suited for each part of the building, according to its use and the amount of strength needed. He knows where to use steel, iron, wood, and plaster. He also knows how much of each kind of building material is needed. If the builder should use plaster where wood is needed, or wood where iron is required, the building would be unsafe.

The same kind of study should be made of the food needed to build, repair, and maintain the body. Different parts of the body have different needs. Foods vary in character and serve different purposes in the body, just as iron, wood, and plaster serve different purposes in a building. The builder does not guess or take chances with any kind of building material that happens to be handy. We should use as much care in planning the food material that is to make and keep us strong.

Many foods have been mixed with so many things to make them appeal to us, that often we do

not know their true value. To know the value of a food we should find out how much of it is suitable for building up the body, how much for creating energy and heat, and how much for regulating the functions of the body. This has been estimated for many foods. It remains for us to plan our meals so that they will contain the proper amount of each kind of food to supply the needs of the body.

**Different Foods Have Different Uses.** — The foods which are body builders and repairers contain a large amount of a substance called *protein* (prō′tē-ĭn). This is found in meats, eggs, milk, cheese, and some vegetables, as peas and beans.

TWO DOGS OF THE SAME AGE
The larger was fed on milk; the smaller had no milk in his diet.

Heat and energy producers contain sugar, starch, and fat. Sugar is found in several vegetables, such as beets, and in fruits. Starch is supplied by potatoes, and by cereals. Fat is contained in milk, butter, nuts, oil, eggs, and fat meat.

Body regulators are coarse and bulky foods. Included among these are bran, cereals, and potatoes. Fruits, leafy vegetables, and water should be

included in this group, as they also aid in regulating the functions of the body by helping in the elimination of the waste matter.

Mineral substances, in the form of salts, a necessary part of our diet, are found in several kinds of food such as milk, green vegetables, and fruits. One kind, common salt, is mined in large quantities in various parts of the world, and is taken also from sea water, and from salt lakes.

In recent years a great deal has been said about certain food substances called *vi'tamins*. Vitamins have value in nourishing special parts of the body and aiding in growth. They are an important part of the composition of our foods; and are found in milk, cereals which are not too much refined, green vegetables, and fruits, especially oranges.

The following table will help you to remember the elements of food and the purpose of each:

| *Element* | *Purpose served* | *Found chiefly in* |
|---|---|---|
| Protein | Builds, strengthens, repairs the body | Meat, milk, eggs, some vegetables. |
| Sugar and starch | Produce heat and energy | Fruits, grains, and some vegetables. |
| Fat | Produces heat and energy | Fat meat, milk, butter, nuts, oil. |
| Mineral salts | Nourish blood, bones, etc. | Salt, milk, green vegetables. |
| Vitamins | Nourish special parts | Milk, cereals, green vegetables, fruit juices. |

**A Balanced Diet.** — When we plan our meals so that they contain enough of each kind of food

material to meet all needs of the body, we have a "balanced diet." The diet which is suitable, or balanced, for one person may not be suited to another. The diet of an infant is not suited to a ten-year-old schoolboy. A man who is sick and confined to bed requires a diet different from that of a man who is working hard in the open air. We also need different proportions of food in summer and winter, and in warm and cold climates.

It is evident that we must vary our food according to our needs. We can tell whether or not we are eating the proper food in the proper amounts by weighing ourselves at intervals of once or twice a month. On many scales there are tables like the one on page 152, which show proper weights for different heights and ages. These weights are average weights, and were found by weighing many thousands of boys and girls. A safe plan is to keep the weight within ten per cent of the average.

**Effects of an Unbalanced Diet.** — Adults are more often inclined to be overweight than children. This is because their diet gives an excess of nourishment, and they fail to take enough exercise to use up the excess, which is chiefly fat-making and not muscle-making material. An excess of heat-producers and energy-producers in a diet deposits fat in the body. An excess of protein, or body-building food, makes an excess of poisonous waste which has to be carried away. This may later result in

illness, shown by headaches and other danger signs. An excess of salts and seasoning makes the kidneys and skin work too hard in getting rid of the excess. An insufficient quantity of protein results in a loss of weight or in failure to make the necessary gain. An insufficient quantity of fats, sugar, and starches makes one inactive, pale, and tired. An insufficient amount of vitamins produces numerous diseases of the eye, skin, bones, and blood. An insufficient supply of minerals especially hinders the development of the bones. The result of this is seen in children who have soft and poor teeth, and children with weak or bowed legs.

**Helping Plan Meals.** — For years mothers have bought the food and planned the meals for their families. They rarely ask their children what food to have or how to prepare it. Many mothers, however, would welcome suggestions from their children in planning meals. This is because more is known about food values now than was known some years ago. Our parents did not have the opportunity, as have children of to-day, to learn at school the foods best suited for us and how to prepare them.

Meal planning can be made as interesting as a game. Go to market and see what foods are plentiful and economical at certain seasons of the year. There are many things to think about when buying the food for a family. We should consider the

number of people to be fed, the kinds of food best liked by the family, and the best and cleanest places in which to buy. We should know the quantity of each food needed and whether the food is wholesome or not. A wholesome food should be nutritious and satisfying. Much of the family income may be saved by wise buying. Sometimes a good food costs very little, but the same food, under a fancy trade name and packed in a pretty package, may cost many times more.

The most important thing to remember is the use of food. We eat for pleasure, to be sure, but the chief use of food is to meet the needs of the body. We need energy for work, play, and thinking. Our muscles, bones, and teeth need building and sometimes repairing. We need some coarse food for the regulation of the bowels. Elements called vitamins, found in some foods, protect the body from certain diseases. When we plan meals we should consider all of the uses of food and the needs of the body.

We choose some energy givers from starchy foods, such as bread, potatoes, cereals, beans, and peas; or from sweet foods, as jellies, cakes, and fruits; or from the fats in butter, milk, nuts, and fat meat. Body builders and repairers are supplied by meat, milk, eggs, cheese, beans, and peas. To help the teeth and bones we should not forget green vegetables, such as spinach and carrots, beans, and

cabbage. The vitamins are found in milk, butter, vegetables, and fruits, especially oranges.

We need never tire of a certain kind of food, because many foods, such as milk, vegetables, and cereals, can be prepared in several ways to look and taste different each time. For instance, milk may be used raw, and in ice cream, cocoa, junket, soups, and puddings.

Try some day to plan the meals for a whole day. Read again pages 142–144 and be sure to include foods for all the important uses. Then show the list to your mother and see what she thinks of your plans.

The following is a sample day's menu, or a plan for three meals. This may be varied for each day of the week by substituting other articles of food that are in season and of equal nutritive value.

| 1. *Breakfast* | 2. *Lunch* | 3. *Dinner* |
|---|---|---|
| Orange or other fresh fruit<br>Oatmeal and milk<br>Egg or bacon (if desired)<br>Whole wheat toast and butter<br>Milk or cocoa | Split pea soup<br>Vegetable salad<br>Graham, or whole wheat, bread and butter<br>Apple sauce<br>Milk | Pot roast of beef and gravy<br>Mashed potatoes<br>Spinach<br>Bread and butter<br>Prune whip<br>Milk |

In homes where dinner is at noon, 2 and 3 may be transposed.

**The Noon Lunch.** — Boys and girls require sufficient food for play and exercise and for study; and

they also need an additional amount for growth. Their lunch, therefore, should be substantial and nourishing. Those who live near enough to school should walk home at noon. If their mothers are at home, of course there will be an appetizing meal prepared. If no one is at home to prepare the lunch, any one can prepare a good lunch for himself. A little warming over of food is easily done.

A School Lunch

Every one who is compelled to take the noon-day meal at school should have a clean lunch box. This should be packed in the morning.

Eat your lunch out in the open air if possible, rather than in the classroom. Do not forget to wash your face and hands before eating lunch, and afterwards, and observe the same rules of cleanliness as if you were at home.

Some children think they can go without lunch and make up for it at the evening meal. A heavy dinner does not make up for the lack of lunch, and it is likely to overload the stomach and disturb sleep. The school lunch should not be such left-overs as cold potatoes or pancakes. Neither do a piece of pie and a bottle of cold coffee or tea make a suitable lunch.

Meats may be served in sandwiches, with the bread well buttered. Cold roast beef is better than ham or chipped beef. Eggs hard-boiled and sliced, lettuce and tomato, make good sandwiches. Peanut butter on crackers or bread, and jelly or jam sandwiches appeal to most children. Cheese of any kind may be used sometimes.

Among the fruits, according to season, may be oranges, apples, plums, and peaches. The vegetables which may be conveniently packed in a lunch box are celery, lettuce, and tomatoes. Some sweets for dessert may be included in a lunch. Gingerbread, cookies, sponge cake, custard, and pudding are suitable.

The most important thing for a lunch is a glass or two of cool, pure milk. If it is possible to prepare a warm drink, cocoa or chocolate should be made with hot milk, not water.

Many schools have lunch rooms which offer at a small cost nourishing hot dishes. Soups, broths, baked beans, and stews are often served. Such

lunches are desirable when it is possible to have them. A lunch composed of pretzels, cakes, candies, and penny ice cream is not wholesome. Food sold around the school building is often exposed to the dust and dirt of the streets and is therefore dangerous. Cleanliness is a precaution more needed for the lunch taken away from home than for any other meal.

The preparation of lunch is good experience in learning how to plan meals, as there are so many varieties of lunches which may be planned. The noon lunch hour is also a good time to learn healthful habits of eating. Try planning your own lunch for several days.

**How to Prepare Food for Use.** — We should not enjoy eating a raw potato or chewing uncooked spinach. There are many such foods which are not suited for our diet unless they are cooked. There are other foods which are valuable in a raw condition, but are more appetizing when cooked or prepared. Raw eggs are nutritious, but most of us prefer them boiled, poached, or fried. Meats are rarely healthful or appetizing when eaten raw.

Cooking food often adds to its value by making it easier to digest. We also add things for seasoning which often increase the food value. Sometimes the chief reason for cooking is to make the dish appeal to our taste and appetite. Every one, boys as well as girls, should have some knowledge of

plain cooking, and the preparation of food for the table. A boy who goes to camp realizes the value of such knowledge. Every girl, irrespective of her social position or wealth, needs training in cooking. Even though she may later employ others to do the preparing of meals, the management of the home will depend on her.

The health of a family is largely dependent upon the planning and preparation of the meals. Good food may be made useless by bad cooking. Costly food may be wasted by lack of knowledge in preparing it.

Cooking is a science. Meats may be roasted, broiled, or fried too long, and the nutritive value removed. Vegetables may likewise be spoiled. Too often a cook discards the gravy or the cooking water which contains the part of greatest food value. Those who have not had the opportunity to learn cooking at school may find useful information in modern cookbooks.

The art of canning and preserving has made it possible for people to enjoy at a reasonable cost food which is out of season. Many women become expert in preserving fruits and other foods at a time of the year when these foods are plentiful and cheap. But almost every kind of vegetable and fruit can now be bought already canned at reasonable prices.

Baking of bread, rolls, muffins, and pastry is the pride of many housekeepers. Economy in feeding

a family on a limited income and furnishing a satisfying and healthful diet is not so great a problem for the woman who knows how to buy and to cook, as for the one who is unskilled or wasteful.

### Helpful Things to Do

1. Make a list of all the sources of food you can think of.

2. Give a list of the different uses of foods.

3. Make up menus or plan three well-balanced meals for one day.

4. Suppose you are helping your mother to pack your lunch box for school. Tell her what to put in.

5. On the next page is a height and weight chart. Measure your height, weigh yourself, and compare with the average weight for your height.

6. Give some examples of how ignorance or thoughtlessness regarding food may injure health.

7. Get some food advertisements from magazines and see what the manufacturer has done to make the food articles attractive.

### Questions

1. Why can animals eat foods different from those that people can eat?

2. What foods can animals eat uncooked, that people must cook? Explain.

3. What is the purpose of cooking? Of seasoning?

4. What is a "balanced diet"?

5. Why is it unsafe always to judge foods by the advertisements?

6. Give three examples of body-building food; of heat-producing food; of bone-building food; of food containing vitamins.

7. Why is fresh fruit especially beneficial?

8. Give examples to show how the value of some foods may be destroyed by bad cooking.

| Height in inches | Boys of 9 to 15 years | | Girls of 9 to 15 years | |
|---|---|---|---|---|
| | Age in years | Average weight in pounds | Age in years | Average weight in pounds |
| 45 | 9 | 46 | 9 | 45 |
| 46 | 9 | 48 | 9 | 48 |
| 47 | 9 to 10 | 50 | 9 to 10 | 50 |
| 48 | 9 to 10 | 53 | 9 to 11 | 52 to 53 |
| 49 | 9 to 11 | 55 | 9 to 11 | 55 to 56 |
| 50 | 9 to 12 | 58 | 9 to 12 | 58 to 62 |
| 51 | 9 to 12 | 61 | 9 to 12 | 61 to 65 |
| 52 | 9 to 13 | 64 | 9 to 12 | 64 to 67 |
| 53 | 9 to 13 | 67 to 68 | 9 to 13 | 67 to 71 |
| 54 | 9 to 14 | 70 to 72 | 9 to 13 | 70 to 73 |
| 55 | 9 to 14 | 72 to 74 | 9 to 14 | 74 to 78 |
| 56 | 9 to 1[illegible] | 76 to 80 | 9 to 14 | 76 to 83 |
| 57 | 9 to 15 | 79 to 83 | 9 to 15 | 80 to 92 |
| 58 | 9 to 15 | [illegible] to 87 | 10 to 15 | 84 to 96 |
| 59 | 10 to 15 | 87 to 90 | 10 to 15 | 87 to 100 |
| 60 | 10 to 15 | 91 to 95 | 10 to 15 | 91 to 105 |
| 61 | 11 to 15 | 95 to 100 | 11 to 15 | 99 to 108 |
| 62 | 11 to 15 | 100 to 104 | 11 to 15 | 104 to 113 |
| 63 | 11 to 15 | 105 to 110 | 12 to 15 | 110 to 116 |
| 64 | 12 to 15 | 109 to 115 | 12 to 15 | 114 to 119 |
| 65 | 12 to 15 | 114 to 120 | 12 to 15 | 118 to 122 |
| 66 | 13 to 15 | 119 to 125 | 13 to 15 | 124 to 125 |

THE FIRST THANKSGIVING

## CHAPTER XVI

## MORE ABOUT FOOD

**Then and Now.** — Eben was a Pilgrim boy. He came over in the Mayflower with his father and mother. He belonged to the little company of Puritans who landed at Plymouth. The first winter was long and cold, and many died of illness and lack of proper food. They had brought some food in their ship, but not enough; and they had no fresh supplies. Eben and his father were good hunters, and they went out into the woods and shot wild turkeys, and rabbits, and sometimes a deer. In this way they survived the long winter. When spring came they planted some seeds that they had brought

over, — beans, and carrots, and onions, and some corn that a friendly Indian gave them. The soil was rich, and the rains and warm summer's sun produced a good crop. The other members of the little colony also had good crops; and there was a bountiful harvest. The people felt so thankful to God for preserving them through the winter and giving them a good harvest that they decided to have a feast of thanksgiving. Everybody brought something to the feast. Eben and his father shot some turkeys, and a deer; others brought fish, vegetables, corn, and wild grapes and nuts from the woods. They had a great feast, and they offered prayers to God who had given them these blessings. That was the first Thanksgiving.

Two hundred years later we meet Randolph, another boy, living on a farm in Virginia. He and his family have cows to supply milk and butter, hens that lay eggs, pigs and sheep for fresh meat, and many acres planted with corn and wheat and all kinds of vegetables. They have plenty of fruit trees and berry bushes. They have all they can possibly eat; but they have to produce it themselves. All their neighbors for miles around do the same. There are no railroads as yet to bring food from distant places; and ships cannot reach them, as they live far from the water. The nearest store is five miles away, and can be reached only by horse.

A hundred years later we become acquainted with another boy, William. He lives in the great city of Chicago where three million other people live. His house is lighted by electricity and heated by steam. He rides to school on a trolley car. He sees few trees, except in the parks. But he is healthy and happy, and has plenty to eat. When he sits down to dinner he finds milk on the table, and butter, and meat, and bread, and vegetables; but he has never seen a cow or any other cattle, except those in the stock yards waiting to be killed for meat. He has never seen cream churned into butter, or wheat ground into flour for bread, or vegetables growing, except a little sickly patch of beans that a neighbor is trying to raise in his back yard. How does William get his food? A milkman leaves some bottles of milk on the back steps before William gets up in the morning. His mother telephones to the grocer, who sends some butter done up in a pasteboard box and a loaf of bread neatly wrapped in paper. She telephones to the vegetable man, who sends some potatoes, some spinach, and some string beans in paper bags. Then she calls up the market, and a cut of beef is sent, all trimmed and ready for roasting. It is William's birthday, and his mother wants to give him a treat; so she telephones to the caterer for a brick of ice cream, — three kinds, chocolate, vanilla, strawberry. William has a good dinner, but he did not have to produce

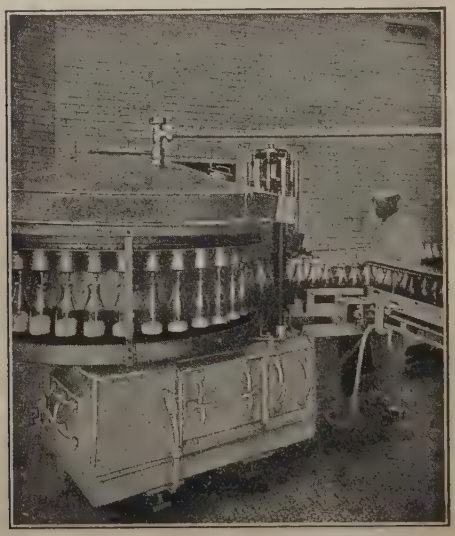
any of the food served to him. Nor did the grocer, the butcher, the vegetable man, or the caterer produce any of the food that they sent. It all came from distant places in freight cars, ships, or trucks.

As you see, William's life is entirely different from the lives of Randolph and Eben. When people began to settle in cities in large numbers, about seventy-five or a hundred years ago, and work at other industries besides agriculture, living conditions began to change. To-day over half of the people in our country live in cities. They cannot hunt in the forests or till the soil. They must be supplied by others.

**How our Food is Supplied To-day.** — The amount of food used in any large city is enormous. Sufficient milk to supply the needs of the city of New York is shipped from thousands of farms scattered over an area of many thousand square miles. Meat is shipped a thousand miles or more, from the West, also from South America. Eggs and vegetables are brought in, from far and near. Some fruits come from distant states or foreign lands, and spices from countries still more distant. Food must be gathered in storage places and sold as needed. This food must all be properly handled and cared for, or it may decay or spoil.

**From Cow to Table.** — If you were to follow any kind of food from its source to the table, you would be amazed at the amount of care taken with it.

Take milk, for example. It is one of the most important articles of food. Clean and safe milk is taken from cows that are kept clean and healthy. They are watched carefully so that they get the proper food and plenty of it. The barn and sur-



*Sheffield Farms Co.*

BOTTLING MILK IN A MODERN PLANT

roundings are kept clean. The straw used for beds for the cows is frequently changed. No dirt is allowed to accumulate. The men who milk the cows wear clean, white uniforms. The milkers wash their hands thoroughly. The cans and pails used to hold the milk are washed with boiling water.

As soon as the milk is taken from the cows it is

carried to a spring of cool water or placed near ice. Wagons and trucks, a few hours later, carry the milk to the shipping station, and trains carry it to the city where it is to be used.

At the station, or in the city, the milk is placed in special tanks and carefully heated for about twenty minutes. This process is called "pasteurizing." The purpose is to destroy any bacteria (p. 33) that may be in the milk so that no disease germs can remain alive. Without coming into contact with human hands the milk is now placed in bottles, previously cleaned with boiling water or steam, and a paper cap is put on the opening. This is all done by machinery to keep the milk clean. Now the milk is put on ice and is ready to be delivered to your home.

**How we Keep Food from Spoiling.** — Warmth is the greatest enemy of most kinds of food. Warmth permits bacteria to grow, and bacteria cause food to ferment and decay. For this reason food dealers use large storage places where food may be kept at a low temperature. Here food will keep for a long time. In our homes we have small ice boxes or refrigerators. We cannot usually get the low temperature of the dealer's storage house, but we may keep the food cool enough for a few days. Even ice will not prevent food from spoiling if the food is not clean and fresh when it is placed on the ice.

Carbonic acid gas, in solid form, is now used to keep food cold and safe. The gas is turned into a liquid and then into a solid. In the solid form it is sometimes called "dry ice." It has a much lower temperature than ice, and is very light. Only a small quantity is needed to keep food fresh during a four or five days' journey.

Our national government, our states, and our cities employ men called food inspectors. These men examine the food which enters our towns to see that it is pure and safe to use. Certain drugs called *preserv'atives* may be added to some foods to make them keep longer. Some of these drugs are harmful to the body. The food inspectors try to prevent the use of the harmful drugs by testing the foods in storage houses and markets before people buy them.

In our homes fruits and vegetables may be preserved in a safe way by boiling them to kill the bacteria, and placing them in clean, air-tight jars to keep new bacteria out. Preserving and canning are now done on a large scale in factories.

Destroy the bacteria that make food decay, and then keep the food clean. That is the way to keep most kinds of food from spoiling. Clean food and clean places to keep the food are essential. Our ice boxes, our cooking utensils, and our kitchens should be very clean, if we are to have safe food to eat.

**The Manner of Eating is Important.** — When you watch a baseball game, a swimming contest, or some other athletic event, you admire the strong athletes. Most people would like to be as strong and skillful as the athletes they see in various contests.

The best athletes are carefully trained. This means that, besides exercising and getting the proper amount of rest, they are required to eat proper food, to eat at regular times, and to eat in a manner to get the most good from the food.

The trainer watches the kind of food and the amount eaten, besides deciding what kind of exercise the athletes shall take. The trainer knows that food is more beneficial when properly eaten. He cautions the men to eat slowly and to chew the food well. This has several advantages. Food which is swallowed without proper chewing and moistening with saliva in the mouth takes longer to digest. Also, there are muscles in the mouth and around the teeth which need exercise to keep them in good condition. One reason why teeth decay is that the gums and muscles in the mouth are not exercised by sufficient use.

Most people like certain kinds of food better than others. Foods usually appeal to us because we like the taste. We should chew our food slowly if we desire to get the taste. Did you ever chew a piece of bread or a cracker until it tasted sweet? Try it, and you will not be disappointed. One

thing about food that is often overlooked is the pleasure it should give us.

**Cheerfulness at Meals.** — Mrs. Musser was an excellent cook. She always planned her menus carefully and served wholesome food, because she wanted her children to be healthy. But no matter how hard she tried, it seemed that one of them, John or Sam or Kate, was always having indigestion. Also, they were thin and nervous and did not seem so contented as other children.

One noon she watched them especially as they ate lunch. The lunch was appetizing and wholesome. But the children did not notice. John and Sam were quarreling over a baseball bat that had been given them for Christmas. Each wanted to use it after school. Kate began a tale of complaint about the way her teacher had graded a test in geography.

Mrs. Musser sighed; the children were always quarreling or complaining about something at meal time. Then suddenly she smiled, for she had just realized the real reason for their ill health. She knew that cheerfulness and happiness at meal time are very important, if food is to digest properly. She thought swiftly for a moment and then stopped the conversation to tell the children her plan. She told them that hereafter there would be a system of fines at mealtime. For every cross word or unpleasant remark at the table the guilty one

would have to give up two cents out of his allowance.

The children were enthusiastic and each one tried to play the game. It was hard at first and the bank where the fines were kept got quite heavy

KATE, JOHN, AND SAM AT LUNCH

the first week. They began to see who could tell the most amusing stories and who could be the most cheerful.

The Musser children are seldom sick now. They look healthy and happy, and Mrs. Musser beams at them across the table as they smile and joke. Mealtime is now the happiest time in the Musser household.

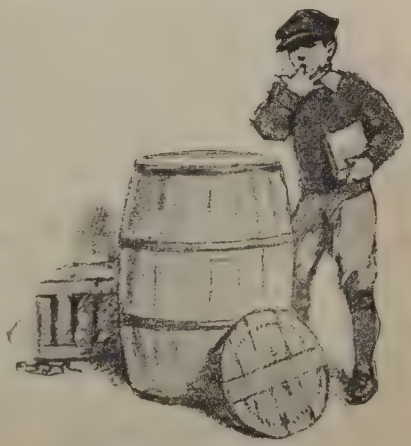
**Rest after Meals.** — After eating, parts of the body are busy caring for the food. There is not enough energy in the body both to care properly for the food and to permit hard physical exercise at the

same time. This is why we are told to rest for a time after meals. You may have noticed that you feel tired after a heavy meal. The digestion of the food requires most of the energy of the body for a considerable period after a meal.

**Regularity in Eating.** — If we ate food at frequent and irregular periods during the day, the organs of digestion would have no chance to rest. Soon the organs that take care of the food would break down. There must be rest periods after all kinds of work. This is one of the reasons for having regular hours each day for our meals. The stomach must have a rest after the work of digesting a meal. It takes from three to four hours to digest an ordinary meal. Eating between meals also takes away the appetite or desire for well-cooked and well-balanced meals. Some people enjoy and benefit from a light lunch before bedtime. As a rule, however, children sleep better and feel better if they do not eat before bedtime. Three meals a day at regular hours are best for nearly all healthy people. The practice of overloading the stomach with food is as harmful as the habit of irregular eating. Digestion is better and the health is improved by eating just enough food and at regular periods.

**Candy and Other Sweets.** — Almost everybody likes sweets. Boys and girls are especially fond of candy, cake, ice cream, and jam. These are useful

foods, and a valuable part of the diet, if eaten in the proper quantities and at the right time. As you have learned, a diet that is properly balanced for health must consist mostly of substantial food, — of meat, vegetables, bread, and milk. Sweets also may have their place in a meal; but that place is at the end of the meal, after the more important needs of the body have been satisfied. That is why the dessert, or, as the English call it, the "sweet," always comes last. The eating of sweets before a meal, or in large quantities at any time, dulls the appetite for more nourishing food.



THE BOY AT THE BROWN SUGAR BARREL

Once a small boy who had been sent to a grocery store on an errand saw a barrel of brown sugar standing in a corner. He liked brown sugar very much and asked the grocer if he might eat a little. The good-natured grocer said: "Help yourself. Eat all you want." So the boy helped himself and ate, and ate, and ate. After a few minutes the grocer noticed that the boy was looking longingly

into the barrel but not eating any more. Then he said to the boy: "Why did you stop?" "Oh," said the boy, "the sugar doesn't taste sweet any more." Of course it didn't. The boy had lost his taste for sugar by eating too much. All pleasures can be spoiled by overdoing them. Eating too much of sweets not only destroys the pleasure of the sweets but dulls the appetite for other food.

There are other unpleasant results that come from too much eating of sweets, such as an upset stomach and headache. Children who eat too much of sweets are undernourished and pale, and also are likely to have poor teeth. There is no strengthening or bone-making material in sweets.

**Water and Other Drinks.** — Water is food, as well as a thirst satisfier. Most foods contain water in small or large quantities. But we drink water because the body needs more than the quantity received from the food. People need to drink from four to eight glasses of water a day. We should drink plenty of water between meals; but too much water with meals may interfere with the proper digestion of the food. Water should always be drunk slowly, especially if cold or iced.

There are many kinds of wholesome drinks besides water. Also there are many drinks with attractive names that are made from water with a little flavoring. These have little advantage over pure water, except that of taste.

Although tea and coffee are made partly of water, they are not healthful drinks, especially for boys and girls. Tea and coffee contain a drug which if used in excess is harmful to the nerves.

Alcohol in any of its many varieties is a harmful drink. Alcohol uses up oxygen and water needed for the work of the body. It upsets the work of the nerves. They cannot properly send messages and control the parts of the body if dulled by alcohol. This is the cause of the dizziness and unsteady walking of a drinker of alcohol. He has lost control over body and mind. For this reason accidents are common among users of alcohol. That is the reason why men who use alcohol are not wanted as engineers of locomotives or as motormen, or in any other positions upon which human life and safety depend.

**Wastes and Refuse.** — We usually think of refuse and waste in connection with food in the body, just as we think of ashes and waste gases in connection with fuel in the furnace. In both cases the refuse and waste must be taken care of.

It is interesting to watch the process of digging coal from under the surface of the earth. Large lumps of black coal are brought to the surface, and are broken into small pieces. While all look black, some of the pieces are not coal. Some pieces are slate rock. This is refuse and must be removed. The coal is later washed and screened. Dust and dirt are removed and the lumps of coal are retained.

Much of the work in coal mining consists in getting rid of refuse material.

In almost every line of work there is some waste and some refuse. Go into any factory or power plant and you will see things thrown aside as waste or refuse. But these are not allowed to accumulate, for they would become a danger or menace to the

Refuse Makes a Yard Both Unsightly and Unhealthful

factory. Cities have laws which tell how the different wastes should be removed. Fire departments warn people not to allow refuse to gather. These rules and laws are for the health and safety of all.

**Four Exits for Waste.** — Nature has similar laws for the human factory, the body. Nature requires us to help in getting rid of refuse and waste for the sake of our health. We are supplied with four routes for removing body wastes. Useless gas and

some water vapor are discharged through the nose and mouth in breathing. A large part of the water we take in our food and drink travels through the body to wash out the waste which is removed by the kidneys. A small part of the fluid finds an easier exit through the pores of the skin. There is also a sewerage system in the body called the "large bowel," or lower part of the intestines. This is used to remove much of the body waste, besides the refuse from the foods we eat.

**How to Assist Nature.** — In order to assist nature, we should know where and how waste is removed, and how we may assist. Waste gas and some water, as stated above, come out through the air passages. We should learn to breathe deeply and properly, and there should be nothing to obstruct the passage-ways in throat and nose.

The body needs plenty of water to help remove waste. One should not forget to drink between meals, and also at morning and at night. The skin discharges waste through its millions of little openings, the pores. Dirt clogging these openings interferes with this process. Frequent bathing of the body is therefore essential. The large bowel or lower intestine, which carries the refuse from food, besides body waste, works well or badly according to our living habits. Good health habits are the aid which nature requires. Eat proper food, drink enough water, and go to the toilet at a

regular time each day, preferably after breakfast; and with these habits be clean. Few people realize how much their health depends on the way in which the wastes of the body are removed. The regular removal of waste is a duty which cannot be neglected without serious results. When children are enjoying their play they sometimes delay going to the toilet when they feel the need. This is a dangerous practice and may result in illness.

### Helpful Things to Do

1. Keep an account of the number of glasses of water you drink each day for a week.

2. Is your family cheerful and happy at the dinner table? If not, try to devise some plan to make mealtime pleasant in your home.

### Questions

1. Savages eat more of their food uncooked than do civilized people. Can you explain why?

2. From what places in this country or other countries do the following come: beef, milk, oranges, prunes, bananas, pepper, potatoes, flour? Look up these places in your geography.

3. Why is it important to keep milk, fruit, and other foods cool?

4. Why is it important to eat slowly?

5. How long were you at dinner yesterday?

6. Why is it important to be cheerful at meals?

7. Why is rest better than vigorous exercise after a hearty dinner?

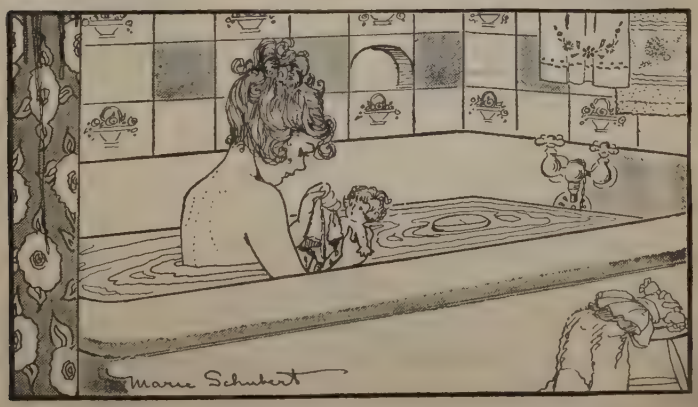
8. What is the importance of having meals at regular hours?

9. When, and to what extent, may candy and other sweets be eaten without injury to the health?

10. How does the body get rid of its waste?

11. Why should alcohol be avoided as a drink?

12. Why are coffee and tea harmful to children?




A Daily Bath is Necessary to Help Remove Body Waste

Sports for Hot and Cold Weather

# CHAPTER XVII

## HEAT AND COLD

**A Healthy Body has an Even Temperature at All Times.** — Place a bottle filled with water in the hot sun, and the water will become warm. Place the same bottle of water in a room, and its temperature will soon be about the same as that of the room. Again, place the bottle in an ice chest, and the water will become cold.

The temperature of the body, however, does not change with that of the surrounding air. In winter or summer, in the cold open air or in a warm room,

the inside body temperature of a person in health remains between 98 and 99 degrees. This constant temperature of the body is needed because the organs work best at this temperature. When the temperature of a person goes above or below the proper degree, it is a sign that the person is ill. The doctor generally takes the temperature of one who is not feeling well by placing the bulb end of a small glass thermometer in the mouth, under the tongue.

A rise in temperature is called fever. A lowering of the temperature may mean that the person is weak and undernourished.

**How the Body is Warmed.** — In a house that is heated by hot water from a boiler the hot water circulates through pipes and radiators, giving off heat as it circulates. It is desirable to have an even temperature in every room. If the rooms become too cool, the fire must be increased. When the radiators become too hot, we regulate the furnace drafts to let the fire cool down.

The blood circulates through the body in much the same way as the water goes through the pipes, and is warmed by the heat that is supplied by food. The blood is nearly the same temperature in all parts, to the tiny vessels in the skin. Here at the surface the blood cools off. When we feel cold or warm, it is not the inside of the body, but the surface, that is cold or warm. Cold makes the

small blood vessels in the skin so small that little blood can come to them. This prevents the blood and the inside of the body from losing too much heat. You have noticed that when your hands are cold they become pale, and when they are warm, as, for instance, after they have been in hot water, they are red. Cold drives the blood away, and heat brings it to the surface. Exercise makes one feel warmer because the blood circulates more freely and fills the small vessels in the skin. When your ears are cold and you rub them briskly, they are warmed by the blood that is forced to the surface.

**What Becomes of Excess Heat?** — The cells of the body continually produce heat; and the amount varies with our activity. There is often more heat than the body needs. Then much warm blood reaches the skin, the perspiration is increased, and its evaporation takes away the excess heat. We perspire most of the time, both winter and summer. We may not always be able to see the moisture on the skin, but there is usually enough to regulate the body temperature. If we become very hot, as on a hot summer day, or after vigorous exercise, we can see the perspiration forming on the skin.

The lungs help the skin in regulating the body temperature. In them at all times there is a large part of the blood. The lungs consist chiefly of blood vessels. An extensive surface of the lungs is exposed to the air that enters and supplies the

blood with oxygen. This is a good place for the blood to rid itself of excess heat. Some of the water from the blood passes out to the surface, and its evaporation has a cooling effect. The air breathed out has more vapor than the air breathed in. You can prove this if you will breathe on a cold piece of glass and notice the moisture that forms on the surface. Then with a bellows blow some ordinary air on cold glass, and see the difference.

**How we Help to Keep the Heat of the Body Regulated.** — The activity of the many millions of cells produces the heat that warms the blood. To do this the cells require fuel in the form of food. There are certain foods, such as fat, that make good fuel. The more of such food that is eaten, the more heat may be produced in the body. This fact is known to people in some countries, and is used to advantage. In the far North the people eat plenty of fat from animals and fish. In hot tropical countries the people eat little of such heating foods.

We should apply the same principle in our habits of living. In winter when it is cold our diet may include a liberal supply of the heat-producing foods, but in summer we should avoid them. Also, in summer, even more than in winter, it is necessary to drink plenty of water to replace the water given off by the body for heat control. You have noticed that there is more desire to quench thirst on warm

days than on cold days. Thirst is a signal from the body for aid in regulating its temperature.

**Clothes and Comfort.** — On a cold day, if we wore no clothing, we should feel very uncomfortable. Our bodies could not meet the heavy demand for heat without the aid of clothes or some other covering. There are some people who can gradually train their bodies to withstand cold. These people require less or thinner clothing than others. For most people comfort and health should determine the manner of dress. Clothes have a more important purpose than style and appearance. Clothes are necessary to regulate the heat of the body. We should dress according to the climate in which we live, or according to the season of the year in changeable climates.

An Eskimo Woman and Baby

Their clothes are made of fur.

Examine a "thermos" or "hot and cold" bottle. When filled with hot or cold liquids it keeps the contents hot or cold for many hours. This happens because the bottle holding the liquid is surrounded by an outer and larger bottle with an air space between. The air space acts as a sort of blanket to prevent heat from going out or coming in.

Clothes do the same thing to the body that the blanket of air does to the contents of the thermos bottle. Clothes do not create heat; they simply prevent the heat from going away from the skin. Air is held in the meshes of the clothing material. Cotton goods are woven close, and there are fewer spaces to hold air. Therefore cotton is cooler to wear than silk and wool, which have wider spaces. Cotton is useful in a warm climate or on warm days, while wool and silk are better suited for cold weather. Wool also helps in maintaining the heat of the body because it readily absorbs the moisture from the skin. When the moisture of the body evaporates on the surface it cools the body.

A Girl from India
She wears cotton clothes.

The general condition of our health has much to do with our power of resisting cold and exposure. People who have recently been ill, very young or frail children, and old people cannot withstand much exposure to cold. In choosing clothes it is wise for everybody to consider comfort and safety before style or fashion.

**Alcohol and Body Heat.** — Some people think that drinking alcohol keeps the body warm on a cold day. This is not true. The feeling that the drinker mistakes for heat is the burning sensation of the alcohol in the stomach. Pour a little alcohol on your hand, and as it evaporates it leaves a tingling sensation that is cooling; but if you should wet a part of your skin with alcohol and cover it with a cloth to prevent evaporation, the alcohol might produce a burn or blister. When alcohol is drunk, the stomach, like the cloth covering, prevents the alcohol from evaporating rapidly, and the walls of the stomach are "warmed up" and the blood circulates rapidly for a few moments. The resulting sensation of bodily warmth is only temporary, however, and is misleading. There is always a prompt reaction, there is no lasting benefit, and one is less able to withstand continued cold after the drink than before it. In a person who has drunk much alcohol the sensations of heat and cold become dulled. Sometimes a person under the influence of liquor has become stupefied and dazed on a cold night and has been found frozen to death on a lonely road. It has been proved repeatedly that habitual drinkers of liquor are not as capable of withstanding extreme heat or extreme cold as those who do not use it.

**Other Suggestions.** — Unusual conditions of climate call for special protection. The temperature

of the skin and its ability to keep the inside of the body at an even temperature vary on wet, damp, snowy, and dry days; and also under different conditions. An aviator knows how to prepare for all kinds of weather before he goes up in an airplane. The flyer knows that the higher he gets, the colder it will be. He also is prepared to run into storms or perhaps to land in wet places. Aviators carry heavy woolen coats, caps which pull down over the face and ears, rubber boots, and warm gloves. They are prepared to protect themselves against cold and dampness.

We should not wear sweaters or overcoats in our homes or in a schoolroom. Rubbers and raincoats are good for protection from wet and dampness when we are out of doors, but they may injure the health if worn indoors.

In bed at night, we should wear night clothes. Our other garments should be hung up to air.

**The Effect of Excessive Heat or Cold.** — On a very hot summer day, if there is too much moisture in the air, we feel uncomfortable, especially if there is no breeze blowing to cool off the surface of the body. If we exercise too much on such a day, causing an increase in the heat produced in the body, we may be overcome. This is what happens when one has a "heat stroke." The same thing may happen if we remain too long exposed to the hot sun; the result may be "sunstroke."

The sun is a wonderful health giver. If, however, we expose our bodies too long to the hot sun, as many bathers do, we may become severely sunburned. This is a very painful experience, as most people have at some time discovered; and excessive sunburn, like any other burn, may be dangerous. Cold cream or grease often helps to ease the pain from sunburn.

Extreme exposure to cold drives the blood away from the exposed parts. The skin becomes white, tingles, and "burns." This is called "frostbite." Exposed parts like the ears, face, hands, and feet are sometimes frostbitten. It is necessary to start the blood circulating in the frozen parts. For this purpose it is better first to rub the part briskly with the hand. Snow or cold water may then be rubbed on. The rubbing gradually restores the circulation. Warming the frostbitten parts with hot water or before a warm stove is dangerous, and should never be done. Stay out in the cold until the circulation has been completely restored.

### Questions

1. What is the right temperature for the body of a person in good health?

2. What two uses has perspiration?

3. Do clothes produce heat? Explain how they keep the body warm.

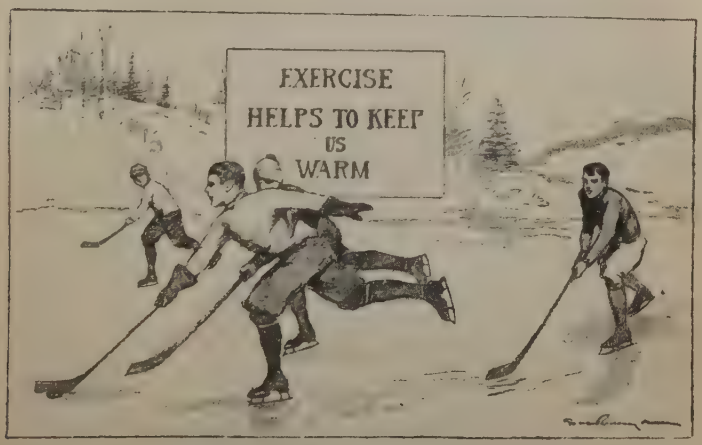
4. Why is cotton clothing worn to so large an

extent by people who live in India and other hot countries?

5. What should be done in case the feet are frost-bitten?

6. What effect has alcohol on body heat?

7. Explain how the body removes excess heat.



## CHAPTER XVIII

## CORRECT POSTURE AND GOOD HEALTH

**What is Proper Posture?** — Posture is the manner in which we hold our bodies while standing, sitting, or walking. Some boys and girls may think that posture has to do only with good appearance. Perhaps they are thinking of the drum-major proudly leading his band up the street, with his chest thrown out, and swinging his stick. Appearance, of course, is important; but our posture, as you will see, affects more than our appearance. Its bearing on health is more important.

A company of sturdy men in uniform, all standing erect, arouses admiration and respect. When we see a team of baseball or football players come out on the field we hear expressions like " What a fine-looking group of men "; " How well they carry themselves." Soldiers and athletes carry themselves well, partly for the good appearance of the company or the team, but mostly because they know that health, strength, and skill depend in a large measure on posture. These men are trained by vigorous and constant exercise to carry themselves erect, and to walk properly. Their success largely depends upon their good posture.

**Posture Affects Breathing.** — Did you ever try to fill a hollow rubber ball with water? As long as you squeeze it flat it will not fill; but when you release the pressure it will fill up. It is the same

PARADE OF POLICEMEN
Notice their good posture.

with the chest. If you keep your chest flat, or partly collapsed by a slouching position, you can draw in only a small quantity of air when you breathe. Soldiers, ball players, runners, and others who take part in physical contests need plenty

of fresh air for their lungs. The activity of the muscle cells and other parts calls for a large supply of oxygen, especially during exercise. Every one who wants a healthy body needs to breathe in plenty of fresh air at all times. People with stooped shoulders and cramped lungs are severely handicapped.

**Bad Posture Cramps the Muscles.** — We have learned that parts of the body that fail to get sufficient exercise become weakened and fail to respond to calls for use. Cramped positions prevent some parts of the body from working and exercising. The parts gradually become fixed or set as if they were in a splint, and in time they become unable to perform their proper functions. People who desire to make the best use of all the muscles should give their muscles a chance to do their best work. A bent back, stooped shoulders, and a flat chest cramp and strain the muscles of these parts, and overwork them so that they cannot respond well when needed for useful service.

**The Balance of the Body.** — One of the wonderful things about the human body, and one in which it differs from the bodies of most animals, is the ability to keep its balance on two small pedestals, — the feet. When one walks up a steep mountain, down a hill, or on level ground, the body always remains erect and does not topple over.

A group of hikers once climbed to the top of a mountain. There they saw a large rock weighing

over a hundred tons. It stood near the edge of a lofty precipice. It was balanced only on two small rocks underneath. It looked unsafe, but the guide said that it had stood there for hundreds of years. The rock was safe because it was properly balanced. This rock, however, was not nearly so wonderful as any properly balanced human body. If the rock were moved to another place it might not be balanced. Human beings can move about anywhere and still remain secure on their feet.

Poor Good Poor Good

POOR POSTURE AND GOOD POSTURE

**How do you Stand?** — What is the correct posture for standing? When one is erect, with the feet together, a line drawn from the crown of the head to a point between the heels should pass along the entire length of the backbone and between the two legs to the ground.

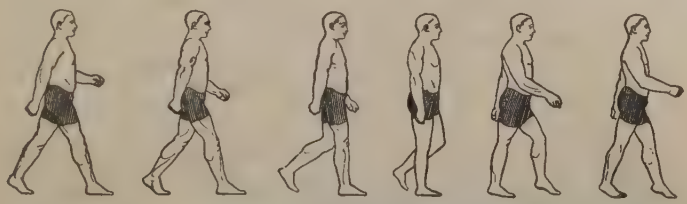
Here are pictures showing the side view of a girl and a boy in poor and in good posture. Notice the differences and tell what they are.

The most common bad habits in standing are (1) slouching forward with shoulders round and head tilted foward; (2) one shoulder lower than the other, and the leg bent at the knee. These faulty positions are bad habits and may be corrected by a little practice and training. We owe it to ourselves to acquire good standing habits, both for appearance and for health. We breathe more freely and feel better when the body is erect. The lungs, heart, and digestive organs all work better when we keep an erect and easy posture while standing or sitting.

**Have you Learned how to Walk?** — The members of a class in school planned to go on a hike into the country on a Saturday. They met at the appointed place. All were smiling and happy. They looked forward to a pleasant walk. But the crowd had not gone more than a mile or two when several boys and girls dropped out. They were tired, their feet ached, and they could not continue. Either they had some trouble with their feet, or they did not understand how to walk properly.

Proper walking is a habit, like proper standing. There are men who have walked hundred of miles, taking only short rests, and have felt no ill effects from the experience. To enjoy walking one must have the feet in good condition, wear shoes that fit, and know how to use the legs. An erect posture of standing is needed also in walking. The muscles of the legs should not be held too stiffly.

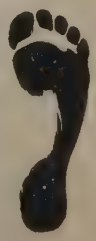
The feet should be lifted from the ground, not shuffled along. The knee should bend with each step to raise the foot well off the ground. The heel



GOOD POSTURE IN WALKING

touches the ground first, quickly followed by the sole and the toes, as the other foot swings forward. The leg should swing freely from the hip.

**Flat Feet are Neither Beautiful nor Useful.** — The feet have arches between the heel and the ball of the foot. These arches support the weight above as does the arch on a bridge or over the doorway of a house. The arches of the feet, however, are springy. This helps to lessen the jar when the weight comes on the foot. When you are taking a bath and your feet are wet, step on a sheet of paper and notice the print of the sole. If your foot is properly arched, the inner edge and center of the foot will be missing in the print. This is where the arch is. If the entire sole of the foot touches the ground when one is standing or walking, it is called "flat foot." Flat feet



NORMAL FOOT-PRINT

occur when the arch is absent or broken down. This condition interferes with walking and standing. Men who have flat feet are refused admission to the army because they tire easily when marching.

**Are your Shoes Right?** — Flat feet and several other defects of the feet are often caused by poorly fitting shoes. Care in the choice of shoes is very important. When shoes are too small or too narrow, the feet become cramped and out of shape. Ingrowing nails, which are very painful and sometimes dangerous, develop. Corns or hard lumps of skin form on the toes and soles of the feet. Shoes that are too large slip and cause blisters.

INCORRECT SHOES CORRECT SHOES

BONES OF A FOOT IN AN IMPROPERLY FITTING SHOE

BONES OF A FOOT IN A WELL FITTING SHOE

**Take Care of your Feet.** — The stockings also should fit well, and should be changed and washed frequently. Frequent bathing of the feet is necessary to keep them in good condition. The nails on the toes grow rapidly. They should be trimmed regularly and be given the same attention that is given to the finger nails.

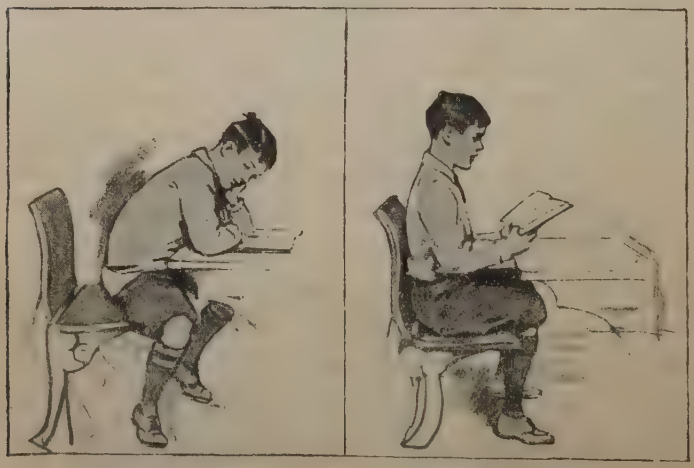
The feet should be properly protected in cold and wet weather. Rubbers are to be worn outside on rainy or snowy days, but should be removed on entering the house or classroom. This is because rubber makes the feet perspire too much and they become tender. The feet are very useful parts of the body and deserve all the care we can give them.

**Do you Sit Correctly?** — Proper position in sitting is an important health habit. When a child sits in an uncomfortable position it may be due to the shape of the chair, but more often it is because of the bad habits of the child. Either of these conditions should be corrected. The correct position of the spine is for it to be straight. Faulty positions in sitting tend to curve the spine to the right or left. A defect known as spinal curvature may be the result.

Sitting on the edge of a chair and leaning back is harmful, as it places an undue strain on the muscles, and tends to produce round shoulders. The spinal column is in an unnatural position and the shoulders are taking the strain of supporting the body. Backs

were placed on chairs to rest the body while we are seated, and should be used for that purpose. Tilting the chair so that it is balanced on two instead of four legs is a dangerous habit. The person has to hold himself tense to prevent falling over. Bad falls often result from tilting a chair.

Chairs should be high enough to permit the feet to rest comfortably on the floor. When chairs are too high or too low, they place a strain on the legs.



POOR POSTURE GOOD POSTURE

Boys and girls when studying should be particularly careful not to stoop over the desk. When you are reading, hold the book up from the desk. When writing, keep the back straight, and lean toward the desk from the hips.

### Helpful Things to Do

1. Bring to school a picture showing a child standing properly; also one sitting properly.

2. Make a poster on standing posture. On it place a slogan that suits your poster, such as "Stand Erect."

3. Make a poster on correct sitting posture.

4. Draw a picture of the sole of a normal foot.

5. When taking a bath place your wet feet on a sheet of paper and see whether the outline shows flat feet or properly arched feet.

### Questions

1. Why should we be careful of our posture?

2. How do soldiers and athletes acquire a good posture?

3. How does poor posture affect the breathing?

4. Describe the proper standing posture.

5. Mention some bad habits in standing and tell how they may be corrected.

6. What is needed for proper walking?

7. Why does a footprint not include the outline of the entire sole of the foot?

8. What is a flat foot? What may cause it?

9. What are some of the dangers of ill-fitting shoes?

10. What care should be taken of the feet?

11. What is the proper position in sitting?

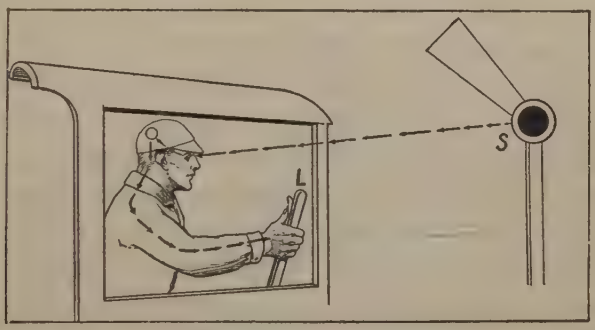
# CHAPTER XIX

## OUR NERVES

**How our Nerves Control us, and How we may Control them.** — Most people admire the engineer on a locomotive. If you have ever been permitted to sit for a time in the cab with the engineer, you have had a thrilling experience. We admire the engineer because, with all the noise and excitement about him, he remains calm. We know that it is his perfect control of his nerves that assures our safe journey. Watch the engineer as he quietly shifts the levers which start and stop the long line of cars filled with people. He is calm, thinks quickly, and shows no excitement. His eyes follow the long stretch of track; he sees a signal, pulls a lever, and slows up the train.

Again he throws a lever and gives full speed. Suddenly, an awkward driver of an automobile,

in crossing the path of the oncoming train, loses control and stops on the track. But the engineer is alert. He sees the car in time and quickly pulls the lever which stops the train. He is still calm and master of his nerves.




How the Nerves Operate

1. An impression comes from the signal, S, to the eye.

2. An impulse, or sensation, travels from the eye to a point in the brain, O.

3. A command goes from the brain through the arm to the hand, and the hand pulls the lever, L.

Watch some of the people in the station and compare them with this quiet engineer. A woman rushes to and fro, excited about reaching the train, although she has plenty of time. When the train is just starting, a man, out of breath, rushes from the ticket window towards the moving train. He could have reached the station in ample time and avoided the excitement. He probably wasted time fussing about some trifle and made a last-minute dash for the station.

The actions of the engineer, the excited woman, and the late-arriving man are in each case controlled by a brain and nerves. The nerves are like a telephone system for the body, for messages and orders are sent through them. The brain is the central office of this system. It sends orders through the nerves to all other parts of the body, and is used whenever we think or feel. Each thought and each act require energy. Each uses up some of the strength or power of the body. The power, when used, must be replaced, or must be taken from the surplus already stored in the cells. Knowing this fact, we should not waste any energy, but put it all to the best use.

Those people whom you saw in the station probably act in the same manner at home or at work. They have formed habits which are difficult to change. The engineer remains calm at all times. The excited people you noticed compel the brain and nerves to send useless messages and do useless work. They have not trained themselves to quiet and calm thinking and acting.

People who do not have control over their thoughts and actions do great harm to their nervous systems. Their actions may also be dangerous to others besides themselves, for they may say or do foolish things through lack of proper control.

**We Need Good Nerves in an Emergency.** — If your school is a large one, you probably have a

fire drill at times. At the sound of the gong every pupil stops what he is doing, rises, and marches out of the building in a quiet and orderly manner. Some day there may be a real fire. You have been trained for such an emergency; and you will all march out safely without the least excitement or confusion. In a similar way we may train ourselves to meet almost any crisis.

There are times in everybody's life when quick and good judgment is required. How we act in an emergency may at some time cause lives to be lost or saved. Only those who have control over their nerves can be of service in an emergency. Most of the heroes of the world are found among the calm, quick thinkers. The man who yells "fire" in a crowded hall and runs for the door; the driver of an automobile who loses control of his car when he sees another coming out of a cross street; the person who runs up and down wringing his hands helplessly when some one falls into the river or gets his clothing caught in machinery — these people are useless in an emergency. Furthermore, they get in the way of other, self-controlled people who could help. Calm, self-controlled people are the most useful citizens.

**Effects of Alcohol and Tobacco.** — Some people think that alcoholic liquors will strengthen their nerves to meet emergencies, or, as they say, "brace them up." But as you have learned, alcohol serves

only as a temporary stimulant, and the reaction is often serious. The continued use of alcohol does much harm to the nervous system.

The excessive use of tobacco also is harmful to the nervous system. Its excessive use may cause nervous fatigue and render the nerves unsteady when one is required to perform acts of great precision and accuracy.

**Effects of Coffee, Tea, and Drugs.** — There is a drug used frequently by doctors to stimulate the nerves and the heart. It is given in very small doses, and the person is carefully watched. If too much is given, great damage may be done to the nerves and heart. This same drug is found in tea and coffee. Men and women are warned against the excessive use of these drinks, and children should not use them at all. Tea and coffee are bad for any one not full grown.

There are a number of other drugs known to have even more dangerous effects on the organs and other parts of the body. Through ignorance or thoughtlessness some people take drugs to produce sleep or to quiet the nerves or to stimulate new sensations. These drugs are sometimes called "dope," or "snow." The damage done by such drugs may lead to years of suffering. It is foolish and dangerous to take any drug not ordered by a doctor.

The repeated use of drugs creates one of the worst habits that one can acquire. It is almost impossible

to break the drug habit when once it has been established. Drug addicts, when deprived of the drug, sometimes so crave it that they will commit crime in order to get a supply. The laws against traffic in habit-forming drugs should be strictly enforced.

**The Nerves Need Rest and Recreation.** — Work of all kinds uses up energy or power. To allow the body to replace energy, rest periods are needed. In school, we work for an hour or two and then take a rest period called "recess." This does not mean that we need to sit still or sleep. What is most needed is a change of activity. When we work too long and steadily at one task we may become restless, because the set of nerves that performs that particular work becomes tired and needs to relax. By going into the fresh air and playing we give the tired nerves a chance to rest and regain energy. It is important to learn how and when to play, as well as how and when to work.

Another important lesson to learn early in life is to know when to quit, without waiting for the signal, fatigue. This lesson should be applied in work, play, exercise, and eating. Too much of anything may be harmful.

### Suggestions for Gaining Control over the Nerves

1. Eat plenty of nourishing food.
2. Avoid coffee, tea, alcohol, tobacco, and drugs.

3. Have the proper amount of sleep every night, — nine or ten hours for a boy or girl under fourteen.

4. Exercise in the open air every day.

5. Have brief rest or play periods between periods of application to study or work.

6. Try to relax completely for five minutes now and then during the day. Sit quietly, lay your hands in your lap, close your eyes, and listen to the clock tick, if there is one in the room. If there is no clock, count slowly to yourself up to three or four hundred.

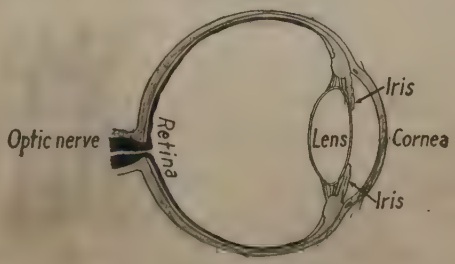
7. Avoid unnecessary excitement.

8. Do nothing to excess, especially to the point of fatigue.

# CHAPTER XX

## THE EYES AND HOW TO CARE FOR THEM

**The Eyes Take Pictures.** — We may compare the work of the eyes with that of a camera, but the eyes are far more wonderful. The eyes take a picture, develop it instantly, and send it on to the brain. With these organs we can see things at rest and in motion, and can enjoy untold pleasures. We may enjoy being told about a beautiful scene,




SECTION OF THE EYE

but this does not compare with seeing it with our own eyes. Eyes are very precious and are easily injured. We should take every care to keep them in perfect condition.

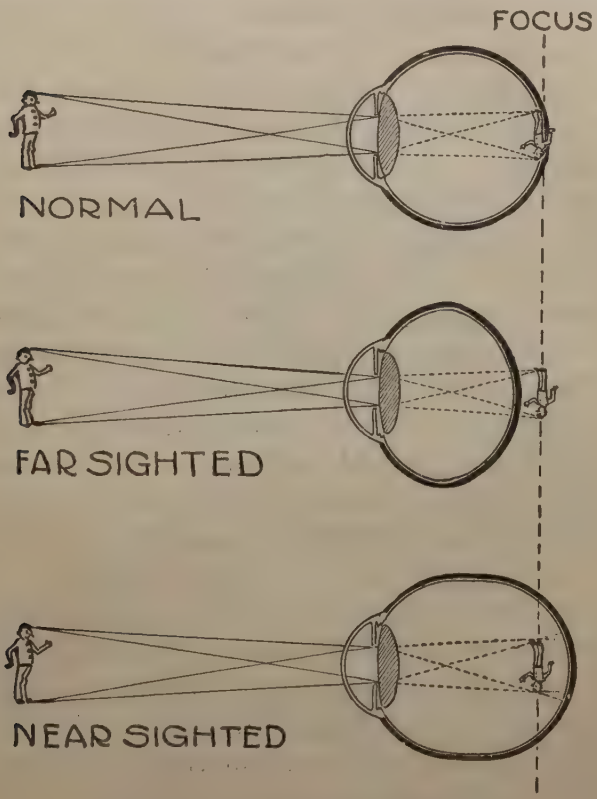
**How Some Eyes are Imperfect.** — When we think of the amount of work required of our eyes, and of the importance they are to our well-being, we

realize the need of taking care of them. During almost the entire time we are awake we are looking at something. Our eyes are constantly sending pictures to the brain. Whether these pictures are correct or not, depends upon how good our vision is. People differ as to their eyes just as they differ in height, size of head, face, and other parts of the body. Some have eyes which see distant objects clearly, while things near at hand look blurred. We speak of such people as farsighted. Others have eyes which can see objects near by much better than those at a distance; they are nearsighted. Still others see everything as if blurred. People who have not good eyesight often suffer from headaches and inflamed eyelids. Most of the defects of eyesight can be relieved by the use of correct glasses.

Some people with eyes that make things look blurred do not know that they are not seeing correctly until a doctor examines their eyes and tells them. After a person with poor vision sees right with the aid of glasses, he is surprised at the difference in his surroundings. For the first time he sees the world as it really appears.

**For Those who Wear Glasses.** — Those who are required to wear glasses should exercise some care in the use of them. They should avoid the danger of breaking the glasses while wearing them, as chips of glass may injure the eyeball. We are compelled to clean the windows in our homes, or soon we

should be unable to see through them clearly. The same is true of eyeglasses. Frequent cleaning with a clean handkerchief or tissue paper is important.




NORMAL AND DEFECTIVE EYESIGHT

The glasses should be placed exactly in front of each eye and rest comfortably on the bridge of the nose. When the frame is bent out of shape so that

one glass partly covers the forehead and one the cheek, we fail to get the full benefit from the eyeglasses. Sometimes, too, a crooked frame may cause extra strain on the eyes.

**Use, but Do Not Abuse the Eyes.** — The eyes will stand a great amount of use, but quickly show the effect of abuse. They are very sensitive, so we should try to have the best conditions for their work. There are various things which are harmful to the eyes. When we are reading, the eyes work best if we hold the book or paper at a distance of twelve or fourteen inches. To obtain the correct distance and angle we should maintain a good posture, whether sitting or standing. We then get the best use of the eyes with the least amount of strain.

The kind, amount, and direction of the light used for reading is important. Good daylight is ideal, but not the direct rays from the sun. The light should come from over the left shoulder. If you are seated with the light coming from the right side and hold a pencil in a writing position, you will notice that shadows of your hand and pencil are in your way. If light comes from the rear, the shadow of the body interferes. Light from the front shines into the eyes and causes annoying glare. It is a bad habit to read while lying in bed, as one cannot obtain a good position for the book. The reclining position puts an unnecessary strain on the eyes.

A continued reading of small print or poor print causes eyestrain. Glare from reflected bright rays of light is one of the greatest dangers to the eyes. Paper for writing or printing should have a dull surface, free from excessive gloss.

We can also abuse our eyes by using them on close work for too long a period without resting them. It is a good plan when reading or studying to look away at some distant object about every ten or fifteen minutes. This gives the muscles of the eye a chance to relax, and the eyes will feel rested.

A great business man who spent most of the working day at his office on close work built himself a home on the top of a high hill. When his friends asked him why he lived in such an inconvenient place, he replied: "When I look out of the window I look across beautiful hills and valleys. Nothing rests my eyes, my brain, and my nerves more than that."

Rubbing the eyes with the hands or fingers is a bad practice. It only irritates and inflames the eyelids; and there is danger of infecting the eyes with germs. When the eyes are tired, and you feel the impulse to rub them, try bathing them in warm water. This is safer and more soothing.

**Did you Ever Test your Eyesight?** — Beautiful eyes, whether blue, gray, or brown, may not be useful. Clear and shining eyes may not always see everything clearly. While pretty eyes are

worth owning, eyes are for a more useful purpose than appearance. The important thing is the eyesight or vision. Do you know whether or not your eyesight is good?

Get some clear, printed letters about one inch high. Place them on the wall at one side of a room. There should be good lighting on the letters, without glare. Stand fifteen or twenty feet away from the printed letters. Close one eye, or place a card over it, and with the other eye open see if you can read all the printed letters correctly. Then test the other eye in the same way. If you can see the print clearly and without effort equally well with both eyes, your vision is good. This is only a rough test, however, because farsighted people see well at a distance but may have headaches or other signs of eye trouble. If you have any doubt about your vision, because of headaches or sore eyes, it is better to have your eyes examined by a physician. In some schools there are school doctors and nurses who examine the eyes of all pupils. Perhaps this is done in your school. There are other eye troubles besides poor eyesight. Good vision, however, usually means good eyes; and a test of the eyesight will usually show up other defects if there are any.

**How the Eyes Protect Themselves from Injury.** Wave your hand near the eyes of some one. You will see the eyelids close at once. This is

nature's way of protecting the delicate eyes. Each eye is furnished with shutters made of skin and muscles. These protectors are called eyelids. The eye has both an upper and a lower lid. Very sensitive nerves guide the movements of the lids.

The lids not only protect the eyes against any strange objects coming near them, but they also protect the eyes from too much light or glare. When we step from a dark room into bright sunlight, the lids almost close to shut out as much of the strong light as possible.

Around the edges of the eyelids are fine hairs called lashes. These hairs serve to keep dust and dirt away from the eyeball. If any dust or other foreign particle gets in the eye, it is very painful. The eye waters in an effort to wash the object away. In such a case do not rub the eye with your fingers, or allow any person to try to remove the particle with a toothpick or match. Keep the eye closed a while; then, if the tears have not cleared away the trouble, wash the eye thoroughly. If the particle does not wash out, have a doctor remove it.

**Carelessness or Ignorance may Injure the Eye.** — There are many people who are blind because of their own or another's carelessness. Children especially do many foolish things which may injure or even destroy their eyes. Let us think of a few of the things which may happen:

A child runs with a pencil, a stick, or an open

penknife in his hand. He falls, and the point of the pencil or knife runs into an eye.

Careless handling of a needle while sewing may result in the needle's reaching the eyes and scratching the surface.

Carelessness in managing an open umbrella has injured many eyes.

Fireworks have injured many eyes, and have cost many lives. On the Fourth of July a few years ago, a small boy tried to set off a pinwheel. The wheel sputtered a moment, and then went out, or seemed to go out. He examined the pinwheel closely to see if it was still lighted, and he soon found out: — bang! Then came the doctor. He saved the eyes, but they were painful and weak for a long time.

Children playing with popguns or air rifles, or throwing stones, may strike another child in the eye. Of course, the child playing with the gun or throwing the stone does not mean to harm any one, but another child may lose an eye through such dangerous play.

A boy once lost the cork that went in his popgun, so he tied a nail to the end of the string. He looked into the barrel of the gun to see that the nail was in place, and at the same time accidentally pulled the trigger. This foolish act cost him the sight of one eye.

The safest way to prevent injuries to the eyes is to hesitate and think before doing anything that

is dangerous. We should consider the safety not only of our own eyes, but of the eyes of other people. A thought in time may prevent years of sorrow.

**Effect of Alcohol and Tobacco.** — No part of the human body is more seriously affected by alcohol than the eyes. They are very delicate organs, with many sensitive nerves. A man who uses alcohol to excess shows the effects of his habit more quickly in his eyes than in any other way. Nobody wants to trust his life in an automobile or a train to a chauffeur or an engineer whose vision has become dimmed or disturbed by the use of alcohol.

Some of the liquor that is manufactured illegally contains poisonous alcohol which especially attacks the eyes. Many people have become blind through drinking such liquor.

Tobacco is not a friend of the eyes. Some people who have smoked tobacco for years may say that their eyes are good. It is not true that everybody who uses tobacco becomes blind or harms his eyes. People are affected differently. It has been proved, however, that people who continually need clear and perfect vision are better off when they avoid tobacco. Baseball players, other athletes, and marksmen are warned against smoking. The man who does not smoke can hit the bull's-eye more often than the tobacco user.

Whatever older people may do, the safest plan for boys and girls is to form no habits which may

later injure their health and handicap them in the work and enjoyment of life.

### Helpful Things to Do

1. Stand about twenty feet away from a card with letters, such as that used by doctors to examine vision. Cover one eye and test the vision of the open eye. Do the same with the other eye.

2. Make a list of some practices that are harmful to the eyes.

3. Tell ways of protecting and saving the eyes.

4. Find a picture or make a drawing of a desk and a child sitting at it in the correct position for reading. Place a window on the side from which the light should come.

### Questions

1. Why are the eyes among the most important parts of the body?

2. How may we know that we have good or poor vision?

3. Why do people need to wear glasses?

4. What care should be taken of glasses by those who wear them?

5. What is glare? Mention some things that cause glare. How does glare harm the eyes?

6. What are the uses of the eyelids?

7. Name some ways in which the eyes may be injured.

8. What effect has alcohol on the eyes?

## CHAPTER XXI

## THE EARS AND THEIR CARE

**Listen for the Signals.** — Many boys have played the game of football, and most girls and boys have seen the game played. Every player knows it is necessary to use both the ears and the eyes to play the game. "Keep your eye on the ball" and "Listen for the signals" are two important rules of the game.

A school team was trying out boys to play on the team. Among those who were chosen was a strong and active boy named Tom Bird. The team met on the field to practice. Tom was wide awake. He

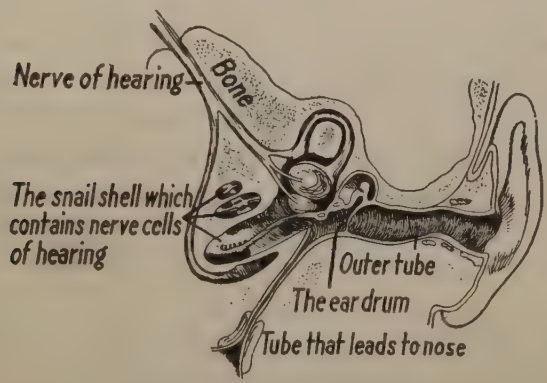
had a good pair of eyes and could watch the ball. But Tom often mixed up the play by going in the wrong direction. The captain took Tom aside and questioned him. The captain noticed that Tom asked him to repeat what was said. It was evident that Tom did not hear well. The captain discovered that when Tom was very young he had had trouble with his ears. Tom said no one had bothered about it, and he had always managed to get along.

The captain could not use Tom on the team. Tom learned the game very quickly and could follow the ball well, but he could not hear the signals. His hearing prevented him from making the team, for hearing is almost as important as sight in football.

**How the Ears may be Injured.** — Many cases of poor hearing begin with colds which affect the nose and throat. It is well to protect ourselves from catching cold. We may catch a cold from other persons. Avoid their coughing and sneezing. We have already learned that every one should use a handkerchief when coughing or sneezing.

Colds should always receive attention and the ears should be watched to make sure that they do not become affected. In each side of the head there is a tube or canal that leads from the middle ear to the nose. These canals aid in hearing by keeping the air pressure balanced on each side of the drum of the ear. Colds interfere with hearing by stopping up these canals.

When the tubes or canals leading into the ears from the outside air are stopped up, we cannot hear well. Wax may accumulate in the canal and close it. Sometimes the services of a doctor are needed to remove the wax.




SECTION OF THE EAR

Do not try to remove anything from the ear with toothpicks or hairpins or pencils. Damage is often done by scratching or breaking the ear drum. Rubbers, pieces of pencil, or anything else placed in the outer ear for fun may be difficult to remove, and may permanently injure the ear.

The hearing may be injured in other ways. Pulling or slapping the ears is harmful. A slap on the outer ear forces the air strongly against the delicate drum and may break it.

**Without Good Hearing we are Handicapped.** — In almost everything we do we need to have good

hearing. We should take special care to safeguard the ears against any harm. Those who are deaf may learn to use their eyes and other senses partly to take the place of hearing; but they are at a disadvantage.

Animals would often be in danger if they did not have very acute hearing. Some animals depend chiefly on their sense of smell to tell if some one or something is approaching. But many wild animals can detect faint footsteps or other sounds at a distance. A dog pricks up his ears and detects sounds long before we hear them. He can hear his master's footstep a long way off.

There are many ways in which we are at a disadvantage if we do not have good hearing. We need to hear well to understand what people say to us. Hearing is also necessary for the enjoyment of many pleasures, such as music, speeches, and the sounds of nature. A boy or girl with poor hearing cannot whistle or sing in tune. Many people are killed or injured because of faulty hearing. A man attempts to cross a street and fails to see an approaching car. If he cannot hear the car or the shouts of warning, he may be run over.

Since the invention of the radio our opportunities for enjoying music and speeches, if we have the power of hearing, are much greater than ever before. Sounds too faint to be heard otherwise are magnified many times by the radio, and then clearly

heard. Ear pieces similar to those attached to a small radio set are used by some deaf people to aid their hearing.

**Poor Hearing Hinders School Work.** — Some children have such poor hearing that they cannot follow the teaching in their class, and therefore fail in their studies. Sometimes such children do not know that their hearing is defective, and wonder why they do not succeed. Years ago teachers were not so particular as they are to-day about such cases, and often children who really were intelligent but had poor hearing, were considered stupid. To-day the ears of all pupils are usually tested by the school doctors; and children who are found to have defective hearing are given a front seat where they may be closer to the teacher. In some cities and towns children with poor hearing are placed in special classes where they may receive individual attention.

**Inattention is a Bad Habit.** — Sometimes inattention is mistaken for poor hearing. To hear properly, even with good hearing, requires attention. Inattention may become a habit. Often such a bad habit begins in the classroom and continues in later life. It may result in failure to succeed. In many occupations, such as radio and telephone operating, a person with poor hearing cannot be employed. An inattentive person is not wanted in important positions.

### Helpful Things to Do

1. Make a list of habits or practices that are harmful to the hearing.

2. Make a list of games which you cannot play well without good hearing.

3. Make a list of occupations which are closed to one who cannot hear well.

4. Make a list of occupations in which one may succeed in spite of defective hearing.

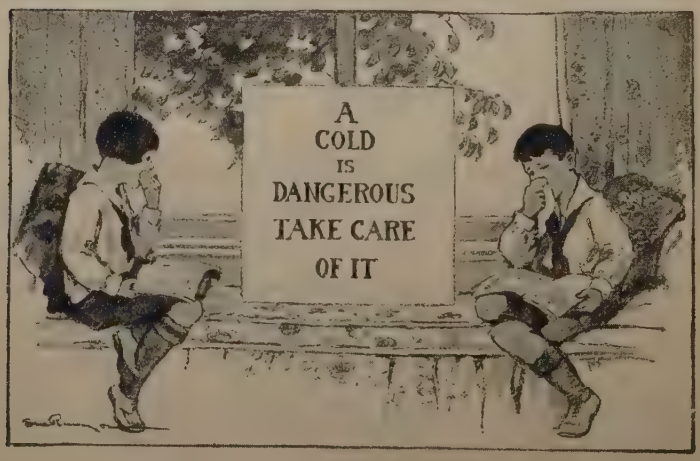
### Questions

1. How may a cold in the head affect the hearing?

2. Why is it a bad practice to pull or slap the ears?

3. In what ways is a person handicapped who has poor hearing?

4. Why is inattention a bad habit?



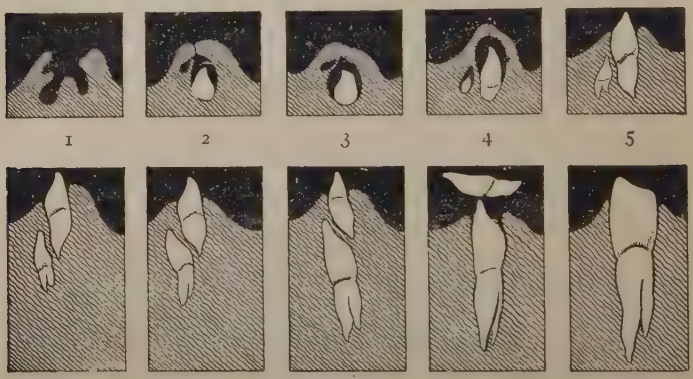
# CHAPTER XXII

## THE TEETH AND THEIR CARE

**How Teeth Develop.** — When a baby is born he does not have any visible teeth. The baby does not have to chew any food, and so teeth are not needed. Milk is his chief food. When the baby is about six months old one or two pearly white teeth peep out from the red gums. The baby is now getting ready for the time when he will need other food besides milk. Each month or so another tooth pushes its way out, until the child is about two years old, when he has the full number of twenty teeth.

These teeth make up the first set. They are called "milk teeth," because they serve during the early years when milk is the chief food. They are not so strong as the second set. The milk teeth do all the work for five or six years. Of course, cereals,

fruits, and well-cooked vegetables are included in the diet of a young child; but the first set of teeth, if properly cared for, can take care of all the chewing and grinding necessary.



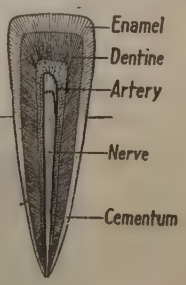

DEVELOPMENT OF MILK TEETH AND PERMANENT TEETH

1 to 5 show the growth of a milk tooth. 4 to 10 show the growth of a permanent tooth, and how it displaces the milk tooth.

The child reaches the age of six years, and is ready for school. About this time there appears behind the milk tooth a sturdier-looking tooth. This is called a "six-year molar" because it appears when the child is about six; and now he has more food that requires grinding and chewing. This is the first of the second or permanent set of teeth. If the child mistakes this molar tooth for one of the temporary or milk teeth and fails to give it care, the tooth may decay and be lost. When a tooth of the second set is lost no new one will grow in its

place. Gradually the first or milk teeth drop out, as the teeth of the last or permanent set push them out to take their places.

**Uses of the Teeth.** — The teeth have important work to perform. They chew and grind all food into small pieces, so that the saliva, or secretion in the mouth, can moisten and act on the food. The saliva is needed to prepare the food for further digestion. The food also should be moistened so that it may not injure the soft parts over which it travels. It is difficult to swallow food that is very dry. The saliva cannot mix well with the food without the aid of good teeth.



SECTION OF A TOOTH

There are other needs for teeth besides chewing. Have you ever listened to a person without teeth trying to talk? He can hardly be understood. The teeth are needed to pronounce certain letters. Say "the thirty-fifth day" and you will notice that the teeth are used several times. Even with only two or three teeth missing from the front of the mouth, there is difficulty in talking clearly.

**Good Teeth Improve our Appearance.** — People like to look well. It is pleasing to know that one's face is well-shaped and attractive. A well-rounded and shapely face is impossible without a set of good and properly formed teeth. Where teeth are

missing, the cheeks may sink in and form hollows. One sometimes sees a face sunken and wrinkled like an old man's because of missing teeth. A full, even set of clean teeth also makes one's smile more pleasant.

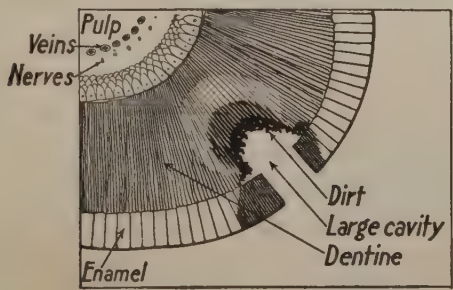
**Bad Teeth Affect our Health.** — The condition of the teeth has a close relation to health. Several forms of illness result from bad teeth, or the improper use of teeth. Indigestion, which boys and girls may know as "stomach ache," is the result of food remaining in the stomach in an undigested state. Insufficient chewing of the food is one of the main causes of this ailment.

If teeth are allowed to decay, poisonous matter may form around them and seriously affect the nerves, the blood, and even the heart. When this

BAD TEETH

happens the bad teeth usually should be pulled out. Serious cases of illness have been traced to bad teeth.

**Teeth of Animals.** — Watch a dog eat. Notice how he bites and tears the meat from a bone. Notice how he chews on the bone for a long time.




CROSS SECTION OF A BAD TOOTH

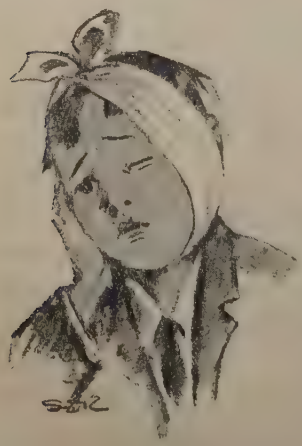
Some of his teeth are long and pointed so that he can readily bite and tear food. If a dog did not have a bone or some other hard food to chew occasionally, he might lose his teeth. The teeth, and the gums holding them, need exercise to keep them healthy. Besides this, the bone and other hard substances act like a toothbrush and clean the dog's teeth.

The teeth of a horse are large and flat. The broad, flat surface is needed to grind the grains, grass, and hay which the horse eats. The shape of the teeth varies in different animals according to the kind of food they need.

**Teeth Need Exercise.** — Our food is of many kinds; therefore we need different kinds and shapes of teeth to bite, tear, grind, and mix our food.

There are a number of muscles in the cheeks and around the jaws. Their work is to move the lower jaw up and down, and sidewise, thus bringing the teeth into action. We have already seen that all muscles need exercise, or they become weak. When we fail to chew food sufficiently, the muscles of the cheeks and jaws fail to get the needed exercise.

**Teeth should be Examined Frequently.** — The bark on a tree protects the tree from decay. Paint on wood prevents the wood from rotting. Teeth have a covering of white enamel which, like the bark of a tree or the paint on wood, is protective. There are always bacteria in the mouth, but they are harmless to teeth with sound covering. Small cracks or breaks in the enamel permit food to lodge there.



Go to a Dentist Before your Teeth Begin to Ache

If the teeth are not well cleaned, the bacteria cause a fermentation in the food, and this may result in decay of the teeth. Biting nuts or other very hard things may injure the enamel. A visit to a dentist at least once a year should be made to see that there are no holes or cavities beginning to develop

in the teeth. Many boys and girls wait until a tooth begins to ache before going to the dentist. Then it is often too late to save the tooth.

**Teeth and Mouth should be Kept Clean.** — The teeth must be kept clean to prevent decay. Not only are clean teeth necessary for good health, but their appearance is pleasing. We feel better when we know that our teeth are clean. Every one should have his own toothbrush and know how to use it and to care for it. It should be kept on a hook or in a glass in the bathroom. When several brushes hang in the same rack they should not touch, as disease germs can easily be rubbed off from one brush to another. Brushes should be cleaned with soap and warm water once a week, and kept dry when not in use.

KEEP YOUR TOOTHBRUSH AWAY FROM OTHERS.

There are many kinds of good pastes and powders that may be used for cleaning teeth, but they are not necessary. A little salt added to a glass of water will do very well, and once a day a fine chalk powder may be used on the brush to produce a good polish. The important thing is to use the brush thoroughly on all parts of each tooth. In the

morning, after each meal, and at bedtime, teeth should be cleaned carefully; and the mouth should be rinsed out after the teeth have been brushed.

In cleaning the teeth do not forget that there are front and back teeth; and that each tooth has front, back, and side surfaces. The front surfaces

Two Children who Know the Value of Good Teeth

of the front teeth are easily cleaned; but it is just as important to clean the back teeth and each part of each tooth. The out-of-sight places are the ones where decay often starts from tiny food particles which remain hidden.

Learn how to use a toothbrush. Rub up and down, and between the teeth. Rub in a circle and from side to side. Reach all spots. Remember

that tiny particles of food left undisturbed between the teeth will ferment. Not only do these particles cause a foul breath, but the acid from the fermentation will eat away the enamel of the tooth. A small piece of "dental floss" should be passed between the teeth to make sure that nothing is left there. Dental floss is a soft cotton thread that is covered with wax to make it strong and smooth so that it will slip between the teeth easily.

**Begin Early.** — From the time the first tooth appears the teeth should be cared for. The fact that there is to be a second set of teeth is no reason for neglecting the first teeth. The first teeth should remain sound and in place until the second or permanent teeth force them out. Otherwise the second teeth may not grow in their proper places; and the set will be irregular and poorly formed.

**What are Teeth Made of?** — The teeth are already partly formed and hidden in the gums at the time of birth. The teeth are formed from lime and other minerals supplied by food similar to that required for all bones. Children who have soft bones that easily bend have not had in their food the minerals and other things needed to make bone cells. These children are late in getting their teeth; and the teeth, when they arrive, are too soft to last long or to stand much use.

Certain kinds of food are especially good tooth builders. Milk, fruits, vegetables, some cereals,

and meats are among the best foods for this purpose. Proper food for the teeth should be eaten in early childhood and in early school years. At this time the teeth are forming, and need proper nourishment and suitable building material.

### Helpful Things to Do

1. Make a poster showing the need of caring for the teeth.

2. Bring an advertisement cut from a newspaper or magazine that tells about care of the teeth.

3. Write on a card the times of the day when you should clean your teeth. Hang it in your room or near your toothbrush at home.

4. Make a list of foods that are good bone and tooth builders.

### Questions

1. How many sets of teeth do people have?

2. How many teeth are in the first set?

3. About when does the first tooth of the last set come?

4. Mention two uses of the teeth.

5. How and when should teeth be cleaned?

6. Why should the first set of teeth be cared for?

7. How do the muscles of cheeks and jaws help the teeth?

8. What care should be taken of teeth?

9. Why should you visit the dentist once a year, even though you do not have toothache?

SMESTER TEST

## CHAPTER XXIII

## THE NOSE, THE MOUTH, AND THE THROAT

**The Nose for Breathing.** — If you should close both sides of your nose tightly with your fingers, and keep the mouth shut, your face would soon become a dark red color and you would gasp for breath. The body needs air because of the oxygen in it. The air must reach the lungs, the loading station. The proper entrance for the air is through the nostrils, the two chambers of the nose. Breathing should be through the nose, because the air should be warmed and cleaned in the nose passages before it reaches the lungs. The heating of the air prevents it from irritating the delicate tissues with

which it comes into contact. The nose also acts as a kind of filter. It is lined with hundreds of fine hairs. These catch the particles of dust and dirt, and some of the germs that are always floating in the air. Just as filters for purifying water need

SECTION OF NOSE, MOUTH, AND THROAT

Air enters the nostrils, passes over and through many fine hairs which catch the dust, and then passes through folds of skin which help warm it. Following the path of the white arrows, the air flows down the windpipe. The black arrows show the path of food. A flap of skin, the epiglottis, at the end of the windpipe, falls down and covers the entrance to the windpipe when food or liquids are swallowed.

frequent cleaning, so does the nose. The dust and dirt caught by the fine hairs should be removed by gently blowing the nose into a clean handkerchief. This also may remove some germs that have settled in the nose.

When blowing the nose, do not use too much force. Above all, do not press the fingers against both sides of the nose at the same time. This causes too great a strain on the middle ear (page 211) and the ear drum.

**Some Necessary Cautions.** — It is an unclean habit to use a handkerchief that has been used by another person. We sometimes see a woman take her own handkerchief to wipe a child's nose. This is a bad practice. Of course handkerchiefs, like all linens, should be kept clean. It should not be necessary for a mother to go through her son's pockets each night to remove soiled handkerchiefs and replace them with clean ones. Each one should take care of this matter himself. If the hands are soiled in using a handkerchief, they should be washed. Soiled handkerchiefs from people with colds or coughs should be washed immediately and not mixed with other soiled clothes.

It is not only bad manners but also dangerous to blow the nose, sneeze, or cough towards the face of any one. This practice may spread sickness, especially if the offending person has a cold or sore throat. Use your handkerchief. Turn the head to one side when blowing the nose or sneezing.

When a nose waters freely, or, as we commonly say, "runs," it may mean that the person has a cold. Remember that many colds are caused by germs and are "catching."

**Mouth Breathers Need Attention.** — When we enter a house we enter through the doorway, although there are other openings on the outside of the building. It may be possible to get in through a window, but this would be inconvenient and possibly dangerous. Fresh air may enter the body through the mouth instead of through the proper opening, the nose. But this is inconvenient and it does not look well. Most important of all, it is not so healthful as breathing through the nose. The air breathed through the mouth cannot be warmed and cleaned as it can in the nose. The mouth is not prepared for a constant stream of air entering and leaving. Soon the mouth and throat become dry, and the delicate parts of the throat and the passages to the lungs become irritated.

Mouth breathing is usually caused by the fact that the proper channel, the nose, is stopped up. In some cases a person may have formed the habit of breathing through the mouth during a time when he had a cold and could not breathe properly. It is necessary to find out the cause of mouth breathing and have it corrected. Usually the cause is some growth, such as adenoids, in the nose passages. Any obstruction of that kind should be removed.

The appearance of the face is changed by mouth breathing. The face becomes broad, the nose flat, and the jaw droops. The mouth breather is often dull, stupid, or slow at thinking. A child who is

prevented from breathing through the nose, because something has grown there, is often sickly and becomes well only after the nose has been cleared.

**The Nose should be a Source of Pleasure and Protection.** — The nose is useful to us in other ways besides breathing. There are very sensitive nerves in the nose that carry messages to the brain and tell us what some things are by the sense of smell. Without seeing, we may recognize fragrant flowers, certain foods, and many other things by their odor. This service of the nose affords pleasure besides being useful. The odor of fresh bread or some favorite dish creates an appetite or a desire for food.

The sense of smell has often helped people to avoid danger, and has saved many lives. The odor of gases that have escaped into the house may warn one of danger. When we enter a closed or poorly ventilated room, the sense of smell should prompt us to open the windows.

Some animals have a very acute sense of smell. They can locate food or danger at a great distance. A skillful hunter studies the direction of the wind and approaches an animal by walking against the wind.

**Some Bad Habits.** — Picking the nose with the fingers is bad manners and also a dangerous practice. One may scratch or injure the lining of the nose and cause sores. Use your handkerchief. Placing rubbers, pencil points, beads, or any other

objects in the nose, as some small children do, is dangerous. It harms the lining of the nose; and often such foreign things are difficult to remove, and may require a painful operation.

**The Mouth is for Food; do Not Misuse it.** — The mouth is the chief gateway to the inside of the body. Through it passes all the food we eat. We are very particular to have our food clean when we buy it and when we prepare it. We certainly should keep it clean on the last stage of its journey. The mouth and its surroundings, especially the teeth, should be kept clean.

It is a common practice for children to place buttons, pennies, jacks, pencils, and many other things in the mouth. These objects may slip down the throat. They may then stick there and choke the child, or pass down into the lungs and endanger his life. The operation of removing them is difficult and painful; and it is not always successful. It is a good rule always to keep away from the mouth things that do not belong there.

**Pencil Points have Germs.** — One day a man visited a third grade in a public school. He asked the children to take their pencils and write on paper a sentence which he had placed on the blackboard. He did this, not to see how well the children could write, but to see something else. What do you suppose he saw? There were thirty-five pupils present; nineteen of them stuck the points of their

pencils into their mouths. The pencils were of soft lead and did not need moistening. The nineteen children had formed the habit of sticking pencils into their mouths. This is a very bad habit and should be broken at once, for it puts the germs that are on the pencil into the mouth, where they cause trouble. Germs in the dust of the air settle on pencils as well as on everything else. Also, through exchange of pencils germs may be carried from one pupil to another.

Do Not Put Pencil Points in your Mouth

**Wetting the Fingers.** — Another bad habit is that of wetting the thumb or finger with saliva to turn the leaves of a book. Although this practice is a common one, even with adults, it is neither pretty nor clean. Fingers should not be placed in the mouth for anything. Dirt and germs are easily carried from things handled. This is a common way of carrying germs of sickness into the body.

**Put Only Clean Things into your Mouth.** — The forks, spoons, and cups that touch our lips need to

be cleaned after using. Sickness is often carried by the use of a cup or glass used by another, especially if the other person has a sore mouth or throat. You should carry your own cup, or use a paper cup, or make a cup out of a sheet of paper. Learn how to make one. It is easily done.

**The Use of Tobacco.** — The use of tobacco in the mouth fouls the breath. Small particles of the tobacco adhere to the mouth and throat and irritate the delicate surface. The poison in tobacco mixes with the secretion of the mouth and is carried to the stomach. It may cause indigestion. This is shown in the case of boys who are made very sick when they smoke for the first time.

**The Throat is an Important Gateway.** — Two important passages into the body start at the throat. One is for the purpose of conveying food to the stomach. The other serves as an air passage to the lungs. The throat is so closely related to the nose and the mouth that whatever affects the nose or mouth may also affect the throat. For this reason the advice that has been given for the care of the nose and mouth applies also to the throat.

The throat has a very delicate lining which is easily irritated. It is quickly affected by food that is overseasoned, and by food and drink that are too hot or too cold. For example, one's throat often aches after eating ice cream too fast. Sometimes a cold goes from the nose to the throat. This

often happens, because the lining of the nose is continuous with that of the throat.

**Sore Throat and Diphtheria.** — A "sore throat" is a common complaint. It is not only painful, but may develop into something more serious if one does not promptly attend to it. The most serious disease of the throat is diphtheria. Young children are more liable to have this disease than older people; but nobody is too old to have diphtheria. Men and women sometimes take it and are very ill. Diphtheria, and some other diseases of the throat, are catching; and one who has a sore throat should be careful not to come into contact with others. In most cities the homes where there are cases of diphtheria are placed under quarantine. Always pay attention to quarantine signs.

**How to Avoid Sore Throat.** — The best way to prevent sore throat is to avoid people who have sore throats, also keep your body in good physical condition by eating plenty of nourishing food, by having sufficient sleep, and by taking regular exercise in the open air. When your body is in a healthy condition you are not likely to have sore throat, colds, or any other ailment.

Another good precaution is to keep shoes and stockings dry. Boys and girls will sometimes play on wet ground or in the snow and then sit for an entire session in school with wet feet, perhaps in a draft. That is a common way to catch cold or to get a

sore throat. Many cases of serious illness result from such carelessness.

**Diphtheria may be Prevented.** — Diphtheria is so serious an illness that in many cases it is fatal. But doctors have found how to prevent diphtheria by the use of a serum. It is a simple and painless practice, somewhat like vaccination against small-pox. It is a very effective protection against diphtheria, and works well in practically all cases. Ask your teacher or your school doctor to tell you more about it.

### Helpful Things to Do

1. Hold your nose tightly closed, and close your mouth. Notice that it is impossible to breathe.

2. Make a drawing of a head, and draw a line showing how air gets into the lungs.

3. Make a paper cup.

4. Make a poster showing things that should be kept away from the nose and mouth.

5. Look at the members of your class and see how many breathe through their mouths.

6. How many in your class stick their pencils into their mouths while writing? If you have this habit, see how quickly you can break it.

### Questions

1. What are the uses of the nose? Which is the most important use?

2. How should we blow the nose? Why?

3. Why should we not use a handkerchief belonging to another person?

4. What are the dangers of breathing through the mouth? What causes mouth breathing?

5. Mention some bad habits connected with the nose.

6. What harm is done by putting pencil points or fingers in the mouth?

7. What can you do to keep from getting sore throat?

8. Why should the mouth be kept clean?

9. What should be done with forks, spoons, and cups after using? Explain.

10. Why are drinking fountains, or "bubblers," placed in schools and public parks?

11. What harm to the mouth comes from the use of tobacco?

12. How may a doctor protect us against diphtheria?

# CHAPTER XXIV

## HEALTH AND GOOD SPEECH

**Importance of Good Speech.** — Speech is one of the most important faculties of the human body. It is our chief means of communication with the rest of the world. It is a power given to man which the lower animals do not possess. The ability to speak clearly and distinctly has much to do with success and happiness. Good speech is dependent on several organs of the body: — upon the brain, the mouth, the tongue, the teeth, the throat, and the lungs. Ability to speak clearly is closely related to the physical condition of all these organs. One who cannot speak distinctly may only have formed careless habits of speech; or there may be something wrong with one or more of the organs that produce speech.

There are, of course, ways of expressing our thoughts without speech. We may use gestures and expressions of the face, just as do people from foreign lands who cannot speak our language. Some deaf people use a sign language and talk with one another by using their hands. Sign language was a very early method of talking; and was much used before language had fully developed. Savages in some countries still use sign language to a considerable extent. We may also transmit our ideas over the telegraph instrument by using a system of dots and dashes, or we may write down our ideas or draw pictures to represent them. While these methods of communication are possible, one who cannot speak distinctly is seriously handicapped.

**The Deaf can Learn to Talk.** — Those who know the value of good speech have no excuse for going through life handicapped by imperfect speech. People who are born deaf are at a disadvantage from the start. They are unfortunate, and should be treated with kindness and patience, and should never be ridiculed. By proper training, however, even they can learn to express themselves quite well. They may be taught to understand others by learning to read the movements of the lips. Many people born deaf can also be taught to talk, in spite of the fact that they never hear language spoken.

**You can Improve your Speech.** — The boys and girls who read this book are probably all able to express their thoughts in spoken language. Some of them, however, may not realize the great importance of distinct speech, and may not know that all of us can improve our speech. Just as we can strengthen our limbs and increase our chest expansion by proper exercise, we can improve our speech by proper training.

**First Learn the Cause.** — If you do not speak distinctly, the first thing to do is to learn the cause. Most indistinct speech is due to improper use of mouth, lips, and tongue. Try looking into a mirror at home while you repeat the alphabet. Watch your lips, tongue, and teeth. Do you round your mouth sufficiently when you make such vowel sounds as O and U? Do you open your mouth wide enough when you say A, B, C, D, E, H, I, J, K, N, R, X, and Z? Do you shut your lips tightly and make an explosive sound when you say B, or P? Notice the part the tongue plays in forming the sounds of L, N, R, and T, and you will see the importance of having your tongue free and loose. Notice how the tongue strikes the teeth in sounding T and D, and you will understand why we need good teeth to speak well. People who have lost their teeth find it difficult to talk distinctly.

Notice the amount of breath that is required to sound such letters as A, F, K, and S. The ability

to breathe properly is very important. One of the first things that a singer or public speaker has to do is to take a long course of exercises for proper breathing and for developing the chest muscles. As you pronounce G, V, Z, B, E, I, in fact, any letter, feel the vibration in your throat. Do this by taking hold of the throat gently with the fingers. You will then understand what an important part the throat plays in speaking. Good speakers and singers must have a "free" throat. A person whose throat or whose breathing is obstructed by enlarged tonsils or growths in the nose, cannot speak distinctly. It is difficult to understand him. Even a slight case of sore throat affects our speaking.

The nose is also important in making many sounds. It is especially difficult to speak clearly when one has a cold in the nose. Even if you have no cold, you must keep the nose clean and open all the time, for clear tones in speaking.

**Stuttering.** — Many people speak with a peculiar hesitancy known as stuttering or stammering. Sometimes stuttering is outgrown, but usually the person afflicted must work to overcome the trouble. People often laugh at one who stutters, but it is cruel to do so. Stuttering is one of the most embarrassing troubles one can have. Very few people need to go stuttering through life. Stuttering sometimes is the result of nervousness; and sometimes it results from trying to talk too rapidly.

PATRICK HENRY WAS AN EFFECTIVE SPEAKER. (Speech against the Stamp Act, 1765.)

It can be corrected or relieved by proper exercises. In some schools there are special classes where children are given such exercises. Anybody may form the habit of stammering who does not try to speak distinctly, and slowly; or who does not think of what he is going to say before he speaks.

**A Low, Distinct Voice is Best.** — Loud, shouting, and harsh voices are very unpleasant to hear; and they are not effective. A soft, clear speech, in which every syllable is distinctly pronounced, is not only pleasanter to hear than a shouting voice, but it carries farther and is more easily understood. A certain young man once thought he would like to become a lawyer. So his father took him to court one day to hear a famous lawyer plead his case. The young man expected to hear a great oration, full of shouting and gestures. He was disappointed, but agreeably so. The lawyer was a modest, quiet gentleman, who talked to the jury just as one would talk at the dinner table, — in a low, but distinct, conversational tone. He did not make a single gesture, except to point once towards the prisoner. He won his case.

### Helpful Things to Do

1. In your room at home, practice speaking aloud before a mirror. Use the pledge of allegiance to the flag, or the first stanza of "America." Notice every movement of lips, mouth, and tongue.

2. Practice deep breathing exercises for a few minutes every night before retiring.

3. Read something aloud to your mother or some other members of your family once or twice a week. Ask your hearers to correct you when you do not read distinctly.

### Questions

1. Why is good speech an advantage?
2. What are the organs of the body upon which good speech depends?
3. How can ability to speak be improved?
4. Why is quiet, distinct speech better than loud talking?
5. How can you acquire a good speaking voice?

## CHAPTER XXV

## COMMON SENSE AND EMERGENCIES

Most of us have five senses — seeing, hearing, smelling, tasting, and feeling — to guide us. Each of the senses is connected with the brain, where the messages are received. We decide the answer to each message and proceed to act accordingly. The great mystery of how the brain returns the answer and orders something to be done is one of the many wonders of the body.

**A Sixth Sense.** — In most cases the mind and brain order the right thing to be done. People who have been trained to think properly use good judgment. The use of good judgment in answer to the impressions or messages from our senses is known as *common sense*. Common sense leads one to do or say the right thing at the right time. It is so important that it is sometimes called the "sixth sense."

**How People Act in a Crisis.** — If we permit our brains to act without our judgment, we may run into danger. Many people without good judgment, and without some other person with common sense to guide them, in a crisis become part of a mob and do rash and dangerous things. Most people can

use good judgment in the ordinary things which happen every day; but few people have trained themselves to act sensibly when something unexpected happens. Here is a good rule to remember in time of danger: If you do not know what to do, keep cool, and do nothing. Wait for something to occur which may take you out of danger. Of course, it is better to be able to have the good judgment that produces the right action at once. It is at such times that heroes are made. Many lives are saved each year by those who have trained their brains to order the right action quickly in an emergency.

Once a woman was frying doughnuts in a kettle filled with hot fat. Somehow the fat caught fire, and blazed up towards the ceiling. Without stopping to think, the woman grabbed the handle of the kettle and ran towards the door. Her clothes caught fire and she fell on the floor screaming. A woman next door, who was known in the neighborhood for her common sense and coolness, ran in, grabbed a rug from the floor, and wrapped it around her blazing friend. The woman was badly burned, but got well. The neighbor's common sense and good judgment saved her life.

In a theater or a meeting place, a cry of "fire" may cause a panic. Keep your seat; do not become excited. There may be no fire, but only an excited person imagining one. If there is a fire,

there will be more danger of injury from the crowding of an uncontrolled mob than from the fire.

**Most Accidents Result from Carelessness.** — Most of the accidents in life are the result of carelessness or the thoughtless acts of some one. Lighting a match near gasoline, hitching on or "hooking" a ride on the back of a wagon or automobile, throwing a stone in a crowded street, playing with a gun in the belief that it is not loaded, and rushing across the street without looking, — these are some of the things which a well-trained judgment will not let one do.

**Sensible People Avoid Danger. Play Safe.** — How many people would be willing to ride in a bus if they knew that the driver did not care where or how he drove the bus? A driver who rode up over the sidewalk, and who never slowed up at street or railroad crossings, would be considered a desperate and foolish man who risked his own life and the lives of others. Yet there are many boys and girls who do some things as foolish as these. Careless and foolish acts are often bad habits, while thoughtful and safe acts are good habits. One can hardly read a newspaper without finding at least one accident that could have been prevented by calm, sensible thinking.

Taking chances is often costly. Luck may be against you. Taking a dare is not bravery. It has got many boys and girls into trouble and cost many

lives. There are times when brave men and women take a chance and risk their own lives to save others. This is quite different from doing foolish acts that endanger one's own life and the lives of others. Before you act, think; and ask yourself the questions, "Is it safe?" "If dangerous, is it worth while?"

**The Dangers of Traffic.** — Most of the accidents to children, especially in large cities, occur in traffic. Automobiles are so numerous that the roads and streets in many places are crowded and unsafe. Most drivers of automobiles are careful and try not to injure any one. Many accidents are caused by the lack of care and caution on the part of the people who cross the streets. A boy who tries to get a "hook" on the back of a wagon or an automobile runs the risk of having another wagon or car injure him as he steps off or falls off.

**Care in Crossing a Street.** — To cross a street safely one needs eyes that see, ears that hear, a brain that obeys, and common sense. Cross a street only at regular crossings. Cross only when the traffic officer tells you to cross. If there is no officer on duty, then look and listen; look in both directions, and cross when the road is clear.

In some schools that are situated on dangerous streets there are "safety patrols" or "safety squads." These are composed of boys chosen because of their good judgment and alertness, and

their business it is to guard the children from traffic dangers as they approach or leave the school. These boys prevent many accidents. If you have a safety patrol in your school, it is your duty, no matter how old and large you are, to obey the orders

OBEY TRAFFIC SIGNS

of the patrol boys. Even if you think you can safely ignore the safety patrol, you should remember the effect of your example on younger children.

**What to Do in Case of Accident.** — Next to knowing how to avoid accidents, the most important thing is to know what to do when an accident happens. Even when people know how to avoid accidents, and exercise reasonable care, some accidents may occur.

The place where you can best show your skill in

giving " first aid " is in the home. There are many small accidents that may prove serious if some one does not give aid at once. After giving aid, do not neglect to correct the thing that caused the accident, so that the accident will not be repeated.

Sometimes an accident may happen when there is no doctor near, and you may have an opportunity to save a life. A few of the common accidents are described in the rest of this chapter and some advice is given as to what you should do.

The first thing to remember in all accidents is to keep cool; think and act quickly. While you are assisting the injured person send for help.

**Slight Injuries.** — Falls may be due to carelessness in leaving things around on the floor where they should not be; or small children may climb to places where they lose their balance. Falls may often do little damage, but sometimes a bone is broken, or a muscle wrenched. For a mere bruise, bathe the injured part with cold water or witch hazel. If there is a wound or cut, first clean it with soap and water, and then paint it with iodine. It is a safe practice to cover a wound with a clean bandage and hold it in place with adhesive tape. This will keep the part clean. Keep a bandage on until the wound has healed. If the injury seems to you to be too serious for your attention, do the best you can, but as soon as possible get a physician.

**Bleeding from Wounds.** — A child has cut his arm or leg, and blood is spurting freely. First press a clean handkerchief, or a piece of clean white cloth, over the bleeding place. Press it hard. Hold it several minutes to see if the bleeding lessens. If it does not lessen, tie a handkerchief above the wound around the arm or leg like a band. Under one point (where the artery is nearest the surface) place a pencil or small piece of wood. Turn or twist the band slowly. Do not make the band so tight that the fingers or toes get black. Turn only enough to stop the bleeding.

A Proper Tourniquet

If the blood is not spurting, but runs steadily, the band, if needed, should be placed below the wound.

**Nosebleed.** — Bleeding from the nose is rarely dangerous. Hold the nose closed with thumb and one finger. Do not blow the nose. Place ice or cold water over the nose and on the back of the neck. If the blood does not stop flowing, a small wad of cotton should be placed near the edge of the opening of the nose. Leave a piece hanging out so that the cotton can be easily removed later.

**Burning Clothing.** — Suppose a child plays with matches and sets his clothing on fire. Take off your coat or pick up a rug or blanket, preferably of wool. Wrap it around the burning child to smother the flames. Put the child flat on the floor and roll him up in the covering. The burned skin may be covered with any kind of clean oil: sweet oil, olive oil, or any oil used for cooking. Severe burns should be properly treated and dressed by a doctor, too.

**Saving Some One in a Burning House.** — If you attempt to save a person who is in a room filled with smoke, first place a wet sponge or handkerchief loosely in your mouth, allowing part of the wet cloth to cover your nose. Crawl along the floor, using a wall as your guide. When you reach the person pull him to a doorway or a window where he can get some air.

**Drowning.** — A boy while swimming suddenly calls for help. If you can swim, go to the drowning boy from behind. If you try to hold him in front, he may get his arms around you and pull both of you down. Hold his neck or his hair with one hand, while you strike for shore with the other arm. If, in his struggling, he tries to cling to you, you may need to stun him and then bring him in tow.

**To Restore Breathing.** — The picture on the next page shows the principal position for reviving a person who is rescued from drowning, or who has ceased to breathe for any other reason, as from

smoke, gas, or electric shock. Place the patient face downward, — stretched at full length on any flat surface. Turn his head to one side. Bend one arm and place the hand under the patient's cheek to keep his face from the ground or floor. Stretch the other arm beyond his head. Straddle the patient below the hips, facing his head, both knees on the ground.

*Red Cross Courier*

A Demonstration of Restoring Breathing

Place both hands over the lower ribs, just above the waist line, about four inches apart, one hand on each side of the backbone, thumbs and fingers together. Keep your arms straight, not bent.

Move the weight of your body slowly forward, arms rigid, bringing the weight upon the hands, pressing forward, not directly down, thus " squeezing out " the patient's lungs as if squeezing a sponge.

Hold the pressure while repeating the words "four hundred, five hundred, six hundred"; then quickly release the pressure, snapping your hands off the patient sidewise. The sudden release of pressure permits the lungs to expand and draw in air. Swing your body slowly back to the first position, relax the back muscles a moment, then apply pressure again.

Repeat — repeat — repeat. Keep up the operation. Work until help comes, or until breathing is restored. Do not give up for at least two hours.

**Broken Bones.** — If bones of the arm or leg seem broken, use a board as a splint. Bind the board firmly to the limb. Do not move the arm or leg more than necessary. Keep the injured person quiet until the doctor comes. The splint you use may not be properly placed, but it at least prevents the broken parts from getting further out of place.

**Fainting.** — In case of fainting, lay the patient flat on his back. Loosen all clothing around the neck. Bathe the face and hands with cold water. Smelling salts or ammonia water sprinkled on a handkerchief may be held before the nose. Do not permit crowds to come so close as to keep away the fresh, cool air.

### Questions

1. Think of one or two instances of people who have acted with promptness and good judgment in an emergency, and report to the class.

2. Explain what is meant by common sense.

3. What is the chief cause of most accidents?

4. What directions would you give to a young child in crossing a dangerous street?

5. What is the Red Cross Society? Mention some things that it does.

6. How would you give first aid for a bad cut on an arm with blood spurting from the wound?

7. How would you give first aid to a child who was burned?

8. Describe a method of reviving a person rescued from drowning.

9. What first aid is needed where a broken bone is suspected?

# CHAPTER XXVI

## LAWS FOR THE HEALTH OF THE PEOPLE

**Why Laws are Necessary.** — Suppose every pupil in the class might do whatever he pleased, — walk around the room, run out into the yard, or talk at any time. There would be no order and teaching would be impossible. The school would not last very long. There must be certain rules, or laws, in the school which everybody is expected to observe.

Likewise, if we are to have a healthy community, there must be certain rules, known as health laws, which everybody is required to obey. Some of these laws are national laws, and affect everybody in the country; others may be laws that apply to the people of a whole state, while others are local laws which affect only those who live in a particular city or town.

**National Laws.** — The Eighteenth Amendment to the Constitution of the United States is an example of a national health law. This law forbids the manufacture and sale of alcoholic liquors for drinking. The harmful effects of alcohol on the health and strength of the people have been known

for a long time; but the passage of this amendment was the first attempt to regulate the manufacture and use of alcoholic liquor through a law affecting all the people of the nation.

**State Laws.** — There are certain state laws to protect the health of all the people of the state. Among these are such laws as those that restrict the number of hours that women and children may work in factories; laws to prevent the pollution of rivers by sewage; and laws to compel farmers who sell milk to keep their barns clean and their cattle free from disease.

**Local Laws.** — We are probably most familiar with the health laws of our own city or town. One sometimes sees a quarantine card on the door of a house. Perhaps "measles," or "diphtheria," or "scarlet fever" is printed on it in large letters. These are catching, or contagious, diseases. Any one who has such a disease may give it to others. That is why the community protects its people by putting a house in quarantine, and requiring by law that the dwellers in the house keep away from other people.

Some communities require all children to be vaccinated to protect them against smallpox, and to prevent this dreaded disease from becoming common in the community.

There are laws that forbid spitting in public places, because it is known that disease may be spread by

spitting. Other rules require that garbage cans shall be covered and water-tight to prevent unpleasant odors and the breeding of flies.

**Good Citizens Obey the Laws.** — These laws are not for the purpose of restricting the liberties of any person, but are made to protect the health and to promote the comfort of the people in the town, state, and nation. Without such regulations, there would soon be more disease and suffering than all the doctors of each city or town could cure or relieve.

Would any one like to live in a town where people were allowed to spit anywhere, to throw garbage and rubbish into the street, to let their cesspools or sink-drains run out upon a neighbor's yard, to send their children to school with mumps or measles? There would soon be much disease and suffering. Good citizens will not do any of these things, or anything else to injure their neighbors. Good citizens do not need health laws. But, unfortunately, in every community there are people who are not good citizens. Such people, through ignorance, carelessness, or indifference, will do things that injure the health of others. In order to protect everybody, therefore, the people, through their representatives in the city or town council, or the state legislature, or the national Congress, pass laws, and officers are appointed to enforce them. The good citizens obey these laws,

not for fear of the penalty of fine or imprisonment, but because they know that a healthy community is the best community in which to live.

### Helpful Things to Do

1. Make a list of all the health laws you know which affect the people of your community.

2. Give examples, other than those mentioned in this chapter, of a national, a state, and a local health law.

3. Write a brief composition on this subject: "How I may be a good citizen by observing the health laws."

# CHAPTER XXVII

## CLEANLINESS AND HEALTH

The experience of thousands of years has shown civilized people how much health, happiness, and success depend upon cleanliness. It might be said that the most prosperous nations in the world to-day use the most soap and water.

When we think of cleanliness we should think of cleanliness in all its phases: — cleanliness of the body, cleanliness of the clothing, cleanliness of the home, cleanliness of the yard and surroundings of the home, cleanliness of the schoolroom, halls, and school yard, cleanliness of the neighborhood, and cleanliness of the entire community in which we live.

A community is a collection of individuals living and working together under common rules and regulations. The community will be clean and healthy, only if the individuals who comprise the community keep themselves clean and healthy. Therefore cleanliness is first of all an individual duty. It is a duty that rests on you and me, wherever we are and at all times.

**Clean Bodies.** — Our first duty is to keep our bodies clean. To appear and feel clean is reason enough; but there is a still more important reason, — to have good health. People who do not keep their bodies clean, — not only the visible part, but the whole of it, — are furnishing breeding grounds for enemy germs, and are inviting disease and ill health.

**Clean Clothing.** — Clean clothing, and frequent changes of clothing, especially of that worn next to the body, are as important for comfort and health as a clean body. Clothing that is saturated with discharges from the pores of the skin is both offensive and unhealthful. Underclothing and stockings should be changed two or three times a week. Economy is no excuse for wearing soiled clothing, because soiled clothing wears out much more quickly than does clean clothing. The outer clothing also should be kept neat and well brushed. Nothing is more offensive than a person who is slovenly about his appearance. Employers seldom

give a good position to an applicant who is unkempt, no matter how well qualified he may be.

**Clean Surroundings.** — It is for our own health and self-respect that we should maintain cleanliness everywhere. When we know that we are neat and clean and present a good appearance, we have confidence in ourselves. We feel pride in ourselves and in our surroundings.

Old clothing kept clean is preferable to a new suit that is spotted and soiled. Cleanliness is not costly, and it is a good investment. Cleanliness adds to our comfort as well as to our appearance.

Good citizens show respect for their neighbors by keeping their homes and yards clean and orderly. One can make one's home and surroundings what one wants them to be, — neat and orderly, or slovenly and ill kept.

Boys and girls who have untidy rooms, with shoes, hats, and clothing thrown around on floor and chairs, and collections of rubbish in corners and on the window sills and tables, are creating for themselves a serious handicap in life because they are forming the habit of slovenliness.

It is also just as much your duty to keep your schoolroom neat and tidy as it is to keep your room at home in good order. A good citizen at home will be a good citizen at school. Once a superintendent of schools made it his practice to visit the schools after the pupils had been dismissed. When

asked why he did that, he replied: "I can judge a school better by the condition of the rooms after dismissal than by the work of the classes in session. You can be sure that there has not been good work in a room where the floor is littered with papers, and spotted with ink, and the books thrown into the desks in disorder."

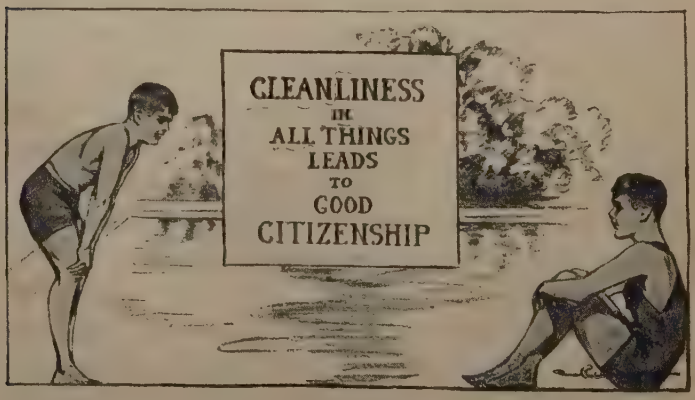
In some schools there are organizations of pupils, such as the "Junior Board of Health," "The Keep Clean Club," and "The Good Citizens' Committee," that devote their attention to keeping the schoolrooms, halls, and yard free from litter, and the walls and fences free from markings. Have you such an organization in your school? If you have not, appoint a committee to see the principal and discuss with him the question of forming one.

In some schools the pupils consider that as good citizens their duty takes them beyond the limits of their school. They conduct clean-up campaigns in the community and persuade adults, as well as children, to keep the streets free from litter and rubbish. In some places groups of pupils have displayed their good citizenship by cleaning up unoccupied lots and planting gardens in them.

In a school in one of our large cities the pupils had a neighborhood "clean-up week." They invited the citizens to their school, so that they might observe how well it was kept. They held a meeting where they showed lantern pictures of neat

and well-kept communities, neat and attractive yards, and beautiful squares and parks. Then they organized the clean-up campaign. They had circulars printed, telling about the campaign, and distributed them among the homes in the neighborhood. They themselves did good work in neglected vacant lots owned by strangers. At the close of the week, committees of pupils made an inspection of the neighborhood.

As a result of the week's work an unkempt and unattractive neighborhood was converted into a neat and attractive one. Of course the pupils felt proud of their achievement; but their parents who coöperated felt prouder than the children. They understood that their children had had a fine experience in practical citizenship.



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